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TREATMENT OF SENILE ENLARGEMENT OF PROSTATE *

S. K. SEN, M.B.B.S., F.R.C.S.E., F.I.C.S.,
Senior Surgeon, Irwin & S. J. T. B. Hospitals, New Delhi

GENERAL PRINCIPLES

Urinary obstruction due to prostatic hypertrophy probably constitutes the most important of all urological conditions owing to its devastating effects on whole of the urinary tract proximal to the internal urinary meatus. Back pressure, infection or a combination of the two, causes a gradually increasing and sometimes irreparable damage to the kidney with the result that the general health of the individual becomes seriously affected and in many cases beyond hope of improvement. Upto a certain point, the kidneys can deal with back pressure and even super-imposed infection but beyond this the general effects of renal insufficiency such as headache, nausea, anorexia, thirst and dry skin gradually become manifest.

The whole principle of prostatic surgery depends upon the renal function and this must always be assessed before any definite plan of treatment is undertaken for dealing with the obstruction. In our view, operative interference, is the treatment of choice but any operative interference with the urinary tract even before any back pressure effect has occurred throws a strain on the kidneys and when they are already damaged may determine a fatal result. Sudden relief of hypertension, as is produced by catheterisation of a chronically distended bladder, is extremely badly tolerated, always producing at least a temporary depression of the renal function. This depression of function of kidneys on which excessive demands are already being made, may quite easily tip the balance against the recovery of the patient.

In our experience suprapubic cystostmy when undertaken has a much more serious consequence than, when later a prostatectomy is undertaken, what is called the second stage operation—as not only does it produce a sudden relief of hypertension but adds to it the shock of urological operation and the administration of some form of anæsthetic. Thereupon in certain cases the removal of prostate is added to the suprapubic cystostomy. This additional strain will account for the appalling mortality which is unfortunately attributed to this operation. In our view the mortality really depends upon the injudicious handling of the individual patient. We hold that preliminary investigation and treatment are of paramount importance and together constitute the greatest protection to the patient. The types of operations which can be performed are various, namely, suprapubic, perineal or transurethral. There is a new method of subpubic operation which I will have occasion to refer to later on. In our view selection of the type of operation varies primarily with the preference of the individual surgeon and secondarily upon the condition of the prostate as determined by the rectal and cystoscopic examinations. With us, the suprapubic prostatectomy in one or two stages is the method of choice. The reason is that it has given us the best result. We have tried to achieve perfection in this method and we have considered this suitable for the majority of cases. We have reserved the per urethral route for the prostatic fibrosis only. We have in the past used this method for minor benign enlargement as well as in inoperable cases and in general we have regretted its use. No doubt, it is gaining popularity amongst a large percentage of surgeons but to practise this method as a routine in all cases of enlargement of prostate we can only mention to condemn it.

Our reasons are that—

(1) it requires very considerable instrumental skill;

(2) the severity of the operation is not at all diminished by this method;

(3) it is a method which is fraught with dangers like (*a*) hæmorrhage, (*b*) infection;

(4) it has to be repeated at frequent intervals and the removal can never be complete;

(5) the electrical cutting and coagulation produce such an amount of scarring of tissue that stricture follows in many cases and the morbidity is very much prolonged.

Our method is to carry out the suprapubic prostatectomy in one or two stages. We usually prefer a preliminary catheteral drainage even if we decide to do the operation in two stages. We prefer in-dwelling catheter for several days before we do the operation. Therefore our two-stage operation is in reality a three-

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stage operation. A catheter is tied, the bladder is gradually decompressed and a suprapubic cystostomy is performed when the patient's condition is satisfactory and then an enucleation of the prostate is carried out, when renal function has fully or moderately recovered which may be either after 2 weeks or several months.

In cases when the patient's condition is good and the obstructing prostate has produced a minimum of diminution of renal function as shown by a normal blood urea clearance and indigocarmine tests, prostatectomy in one stage is the method of choice with us. But in patients, even with impaired renal function, the advantages of two-stage operation are so great that they more than outweigh the inconvenience of a fortnight's stay in a Hospital or Nursing Home combined with the risk of a second anæsthetic and consequently it should always be advised whenever the least doubt arises concerning his general or renal condition.

A common mistake is to presume that if the urine is free from infection the dangers are small; as a rule whenever the bladder is opened sepsis is invariably introduced and must cause a greater or lesser degree or even sub-clinical degree of urinary infection and may persist for 10 days or a fortnight before urological resistance to the infection is acquired. The advantage of a one-stage prostatectomy besides the obvious, is that it is easier to perform. Invariably after a suprapubic drainage there is a shrinkage of the prostate. The bladder is adherent, the space available is limited and the enucleation is far more difficult. The only advantage of the shrinkage is diminution of the hæmorrhage. The final decision of a one- or two-stage prostatectomy must depend upon the individual surgeon who must be guided entirely by his experience, clinical instinct and a correct interpretation of all the available data.

We have never considered extreme age as a contraindication to a prostatectomy. In our series the oldest patient was 110 years old. We however are reluctant to operate upon a patient with

(1) increasing feebleness of senility,

(2) renal damage which fails to improve after preliminary treatment,

(3) severe sepsis,

(4) severe cardiovascular or pulmonary conditions.

We consider that where severe cardiovascular and pulmonary conditions exist a consultation with a physician in conjunction with the anæsthetist is of paramount importance. The physician is in a better position to make careful enquiries into the cardiovascular, pulmonary and nervous systems and it is he who is to decide whether an operation can be undertaken without undue risk to the patient.

Estimation of Renal Function

We have developed a definite routine of investigation of the renal function. It is as follows:—

(1) Blood urea estimation.

Normal between 20 and 40 mgm. per cent. We never undertake a one-stage operation if it is above 50 mgm. per cent. In that case we prefer a two-stage method. Even before one- or two-stage operation we prefer an in-dwelling catheter for one week.

(2) Intake and output graph in normal renal function run close to each other and almost parallel.

(3) Excretion pyelography to assess renal anatomy and physiology.

(4) Indigo-carmine test following an examination cystoscopy which is routine with us. 4 c.c. of 0·4 per cent solution injected intravenously should appear within 7 to 10 minutes and disappear in 12 hours.

(5) Urea clearance test of Van Slyke

$$\text{1st hour } N/74\times 100 \quad 100\%$$

$$\text{2nd hour } N/54\times 100 \quad 100\%$$

$$\frac{\text{N-Urine urea}\%\times 2}{\text{Blood urea}}$$

$$\frac{\text{Urine}}{\text{Blood}}\ \frac{\text{urea}}{\text{urea}} \times \text{sq. root of vol. c.c.}$$

If reading is 60 per cent or below the kidneys are badly damaged. Above 70 per cent we regard fair function.

(6) Blood creatinine estimation.

Operative Treatment

It is our practice to deal with all cases of benign hypertrophy by the suprapubic, one- or two-stage method. Therefore I shall describe in some detail the procedure adopted by us in the management of our cases. We do not advocate catheter life although it is said to be consistent with years of comfort. In our opinion, inoperable cases are utterly few and we prefer to recommend to this small percentage of cases a permanent suprapubic drainage, a procedure which in our opinion is much safer and more comfortable. We prefer in all cases however when a catheter can be passed—to use an in-dwelling catheter for a few days. It decompresses the bladder slowly, makes the genito-urinary system more resistant to infection and improves the tone of the bladder musculature.

Anæsthetic—Our routine is NO_2, O_2 and ether but at times we use local or in some cases cyclopropane. Our induction is always with pentothal sodium. Even in cases where we use local anæsthetic we prefer a small dose of pentothal sodium specially at the time of enucleation. We used to tie the vasa defferentia in the majority of cases until 4 years ago but we have now given up this procedure as we were convinced that even when the vas is tied and an infection is threatening, invariably the cut distal end of the vas gives rise to an abscess formation. We have had a few cases of epididymo-orchitis following prostatectomy but this has been easily controlled by sulpha drugs or pencillin.

After exposing the bladder our procedure is to incise on the fundus as high as we can on the apex of the bladder. This can be recognised by the remnant of urachus. This gives us enough room to enucleate the prostate even at a later date. We have seen in a

large number of cases where the sectio alta had been performed elsewhere we had hardly any room to introduce our hand to enucleate the prostate. The tiresome dissection and risk of opening the peritoneum becomes quite unnecessary if there is enough room between the symphysis pubis and the suprapubic fistula.

The bladder is explored with a finger or by introducing illuminated retractors and prostate is examined from above and the cystoscopic findings confirmed, and any stone found is removed. If prostatectomy at this stage is not proposed then the bladder is closed with a large drainage tube. Adhesion between the bladder and the undersurafce of symphysis pubis becomes a source of great inconvenience later. This in our opinion is entirely due to inadequate drainage of the space of Retzius. By pushing the drainage tube of the bladder inwards after closure of the wound one ensures that the distance between the skin and bladder remains as great as possible. This prevents prolapse of the mucous membrane of the blader through the wound which causes delay in closure of the suprapubic fistula. In cases where a permanent suprapubic is desired this manouvre ensures a maximum length of track which later prevents leakage past the catheter. It is wise also to pass a skin stitch through the bladder tube as an additional precaution against the bladder rising to the surface.

If a prostatectomy has been planned at the same time the surgeon goes over to the left side and with the forefinger of the left hand in rectum steadying the prostate, enucleation is carried out.

When the second operation has to be done after 14 days, then on the 12th day, the renal function is again estimated. If it is found normal then the operation is undertaken. If still some doubt exists, then after this at weekly intervals the renal function estimation is repeated until the results found are satisfactory. In our experience if the kidneys do not recover to a reasonable state within 6 months then they are not going to recover any more. In those cases only, we advise a permanent sectio alta, otherwise we are very reluctant even in cases which are apparently in a hopeless condition, to advise a permanent suprapubic, because so far our percentage of such cases are very few. We have great faith in the power of recovery of the kidneys.

The procedure adopted by us for the second stage is as follows: The patient is rolled over to his right side and the part of the table under the left lower extremity is draped with sterile towel while the assistant holds the limb up, which is also draped. Then the patient is placed in supine position and the surgeon stands on the left side of the patient. The bladder is mopped dry with narrow gauze strips, through the fistula. Two incisions are made, each beginning 1″ above the fistula converging below to meet just above the symphysis pubis. Partially healed scar 1¼″ of the skin and as much of the suprapubic track as possible is excised. Then the skin edges are undercut for 1″ on either side.

Then an incision is made beginning at the lower end of the cystostomy wound to the lower end of the skin wound, strictly remaining in the middle line. The incision cuts all the tissues, mainly consisting of granulation tissue, rectus sheath and the anterior bladder wall. Towel covering the left leg is turned back and the index finger of the left hand is introduced in the rectum, the nurse flexes the left knee a little bit. The prostate is pushed up and steadied.

With the right forefinger the internal meatus is sought for and the finger is forcibly introduced through the meatus into the prostatic urethra. In the majority of cases a plane of cleavage is at once discovered. In certain cases it is necessary to press the finger against the symphysis pubis to rupture the mucosa to find the plane of cleavage. This breaking through is at the anteroinferior margin of one or other lateral lobe just external to verumontanum. Inferior and superior borders of the lateral lobes are followed round to the midline, first on one then on the other side, the finger slipping into the cleavage between the tumour and the false capsule which is really flattened-out remains of the normal tissue of prostate. When the tumour is free all round, the hand is taken out and again both index and the middle fingers are introduced. These two grasp the loosened tumour and a sharp pull on it frees it from its last attachment with the prostatic urethra. It must be remembered that the enucleation is of the pathological tissues only and therefore recurrence is quite possible. We have one case on our record who was operated in 1938 by us and again in 1947. He is now hale and hearty. Finally all tags and small adenomatas are removed if on palpation bimanually they are apparent.

The vesico-prostatic opening is usually wide open and it is a conical shaped cavity but sometimes the mucous membrane of bladder is very tough and the communication between the two cavities is intervened by a diaphragm-like structure with a small hole in the middle. This is one of the causes of non-closure of suprapubic fistula. I have had the occasion in 3 cases to introduce a cystoscope through the fistula and then divide the diaphragm. If this diphragm is felt or seen at operation then it must be split. I prefer to split it posteriorly.

I have now for the last 5 years given up worrying about the hæmorrhage. In the second stage the hæmorrhage is negligible. But if one-stage prostatectomy is undertaken then there is usually a much more profuse hæmorrhage. I used to apply two posterolateral stitches at the two sides in an effort to catch the bleeding vessels as well as to partially retrigonise the bladder. I have given up this procedure altogether, so have I given up packing the cavity. A simple irrigation with hot water usually serves to arrest the profuse bleeding, failing which a three minute compression with a piece of gelfoam effectively stops the bleeding. A slow steady ooze persists on an average for 5 days but stops by itself very soon. The bags or Andrew's tubes or packs increase discomfort, produce spasms and pain and invite infection.

If the operation is in one stage the wound is stitched in layers but when it is a second stage no effort

is made to differentiate between the anterior bladder wall and anterior rectus sheath and both are stitched together by a few interrrupted stiches after inserting a large drainage tube in the bladder.

The after-treatment consists of free use of morphia at 6-hourly interval for the first 24 hours. Bladder irrigation through a catheter in the suprapubic drainage tube is started after 24 hours and is carried out once or twice a day. On the 5th day when bleeding has ceased the supranubic tube is changed and a smaller size tube introduced. This is kept for 2 days and is then removed. Bladder irrigation is carried on till the wound becomes too small to introduce a catheter. This usually happens on the 12th or 14th day. After this irrigation through the urethra is carried out daily. The patient is also encouraged to micturate which is aided by daily, or twice a day enema of plain water. By 14th to 21st day he begins to micturate and the suprapubic wound closes usually on the 21st day. At first there is a lack of control on the act of micturition but the patient becomes completely normal soon when he acquires a better control on the use of his compressor urethræ.

Complications

1. *Hæmorrhage*—In our series of cases we have never had any hæmorrhage which has not been controlled by ordinary measures.

2. *Pain*—Postoperative spasms are a troublesome complaint. It is minimised by no packs, bladder wash and antispasmodics.

3. *Renal failure*—It is preventible. If it sets in, 2½ per cent soda sulph. i.v. drip has been found most useful by us.

4. *Infection*—Some degree of cystitis is inevitable and when moderate is in our opinion advantageous.

5. *Obstruction*—In certain cases there persists a little obstruction specially in fibrous types or after severe infection. This gives rise to some degree of incontinence also. A few dilatations usually cure the condition.

6. *Failure of closure of S.P. fistula* is due to—

(1) Severe cystitis.

(2) Adhesion of bladder to undersurface of symphysis pubis.

(3) Infection of the track.

(4) Excessive scarring.

(5) Diaphragm formation.

(6) Stone formation resulting from infection of bladder.

The cause has to be treated.

Results

From April, 1938 to October, 1948 I have had the opportunity of handling 1,189 patients consecutively. I have since then also done another 40 or 50 cases but the full records of the recent ones are not available yet. Some of them are still in the hospital or the Nursing Home. The oldest man in our series was 110 years of age and the youngest was 47 years old. The mortality has been remarkably low in the prostatectomy cases but excessively high after the so-called simple operation of suprapubic cystostomy.

I. *Analysis of the symptoms:*

1.	Frequency	All cases (100%)
2.	Haematuria	261 cases (23%)
3.	Pain	24 cases (2%)
4.	Stream smaller eventually dribbling	583 cases (53%)
5.	Difficulty (hesitancy)	1002 cases (98%)
6.	Retention: Slow onset	583 cases (53%)
	Acute onset	187 cases (17%)
7.	Incontinence	583 cases (53%)
8.	Sexual disturbance (as far as could be elicited)—	
	Increased desire	487 cases (44%)
	Perversion	21 cases (2%)

II. *Age Incidence:*

		Operations performed	
		Prostatectomy	Suprapubic only
1.	47 years	1 case	
2.	50-55 years	28 cases	
3.	56-60 years	170 cases	
4.	61-65 years	291 cases	
5.	66-70 years	446 cases	
6.	71-75 years	224 cases	
7.	76-80 years	128 cases	
8.	81-85 years	34 cases	
9.	86-90 years	21 cases	
10.	91-95 years	4 cases	
11.	97 years	1 case	
12.	110 years	1 case	
		1096 cases	93 cases

III. *Mortality:*

Prostatectomy—4 cases 0·36%	Suprapubic only.
1. Three cases died within 24 hours of operation of shock.	42 cases=45% 55% with permanent suprapubic.
2. One case died of an attack of coronary thrombosis 3 weeks after the operation.	Majority of death was due to uraemia.

IV. *Morbidity:* Longest stay in hospital 132 days. Minimum stay 18 days.

V. *Complications:*

1.	(1) Abscess on distal end of vas	= 21 cases
	(2) Epididymoorchitis	= 19 cases
2.	Cystitis severe	= 71 cases
3.	Persistent fistula taking long to heal due to various causes	= 62 cases

VI. *Associated other diseases:*

1.	Coronary diseases	198 cases
2.	Hypertension (180-100)	426 cases
3.	Myocarditis	27 cases
4.	Diabetes	392 cases
5.	Paralysis agitans	3 cases
6.	Hemiplegia	1 case
7.	Mental changes	28 cases

VII. *Results of Millin operation:*

Out of 10 cases, 4 died, 3 developed strictures, 2 had severe sepsis and one was cured without any incident.

Conclusion

Prostatic obstruction is a very prevalent condition in Northern India where I come from.

I have endeavoured to tell you the method of treatment that we follow in our unit for the treatment of senile hypertrophy of prostate. I have not included the fibrous prostates and median bars nor have I included the cancer cases which are also quite common and constitute at least 12 per cent of bladder neck obstruction of old age. I have also summarised an analysis of our results. I know the methods used by us are open to criticisms but I have frankly told you what we do. Three methods of removal of prostatic glands were recognised upto recent months. No one method has been wholly satisfactory. Now a fourth method of retropubic operation has also been described by Terrence Millin. I am not in a position to determine the value of the 4th method. Theoretically it sounds very reasonable and scientific but having tried the operation on 10 consecutive cases I have started fighting shy with this method. In spite of what the author says the space of Retzius is a dangerous route to travel. The room available in my opinion is utterly limited. The bleeding is profuse throughout the operation. When diathermy is used the destruction and necrosis is enormous and the results obtained by me are by no means half as encouraging as with the method I am used to.

Although suprapubic operation requires passage through the bladder mucosa twice in order to reach the gland which no doubt in truth lies outside the bladder, the enucleation is done blindly and it offers no possibility of removing carcinoma which has invaded the capsule, yet in the benign hypertrophy this particular method is most gratifying, considering the ultimate results obtained.

The transurethral resection, althugh gaining favour with modern surgeons, to my mind is an operation which should be strictly reserved for fibrous prostates and for some inoperable cases just to give relief as a purely palliative measure. It has a very large mortality, requires very great experience, its morbidity is prolonged by the necrosis of tissues treated electrically. A large percentage of them cause stricture afterwards. Further the operation has to be repeated at frequent intervals.

Perineal prostatectomy is truly a surgical operation. I have no experience in this method. It requires considerable special equipment. Persistent fistula, injury to rectum and subsequent inconvenience to the patient are three big bugbears in this operation.

I thank you very much for the patient hearing that you have given me. I hope I have been able to do justice to the cause of treatment of benign enlargement of the prostate in my humble manner.

VALUE OF ESTIMATION OF TOTAL PLASMA PROTEIN IN PULMONARY TUBERCULOSIS*

K. S. RAY, M.A., B.SC., M.B., CH.B. (EDIN.),

B. P. NEOGY, M.B., M.R.C.S., M.R.C.P.,

AND

A. C. MAJUMDAR, M.SC.,

From the Jadabpur Tuberculosis Hospital (West Bengal).

Introduction

Environment, climate as well as adaptation and nature of food consumed by different people in different countries play an important role in nutrition of human beings. An attempt has been made in this communication to study the nature of nutrition in pulmonary tuberculosis cases in India. The data published by workers in other countries represent more or less chronic type of infection. It is well-known that the nature of disease in this country, especially in patients hailing from rural or semi-rural areas, is quite different. As such the metabolism in the two groups will naturally vary. Nature of diet consumed by our people is also quite different from that of the Western countries. Therefore it was thought advisable to make a blood protein estimation of all cases admitted into this Hospital during the last two and half years.

Studies of this nature in pulmonary tuberculosis are not new. The wasting or loss of flesh in tuberculosis evoked a lot of interest to the clinician, pathologist and biochemist for a long time. Everybody was interested in the nature of this wastage. During the latter part of the last and first few years of this century, investigations, were made mainly on the excreta, *e.g.*, urine, stool, sputum, etc. (Stadelmann[1], 1899; Schrach[2], 1899; Clemens[3], 1910; Ewald[4], 1899; Schumm[5], 1923; Flick[6], 1905; Walsh[7], 1906; Dielt[8], 1922; Kummer *et al*[9], 1914). Useful records are available on the subject which throw much light on the metabolism of this disease. During the last two decades much wider interest was taken on the subject of nutrition and balanced diet in health and disease. Newer and simpler methods have been found to measure the nutritional level of a person so that these may be applied to a larger group of people. These investigations and methods have given further impetus to the research of the nature of wastage of tubercular patients. (Ott[10], quoted by May; Wells and Long[11], 1934; McCann[12], 1922).

It is not the intention here to mention the list of all persons who have worked with this problem. Attention may, however, be drawn to an interesting paper of Getz *et al*[13] (1944), who have made an extensive

* Read at the 6th Tuberculosis Workers Conference, Calcutta, 1948 and pending publication in the transactions of the Conference.

study on the nutrition of tuberculosis and have given an extensive bibliography. Here they have made a comparison of the analysis of blood in tubercular as well as non-tubercular subjects. The studies were mainly on the estimation of vitamins. albumin-globulin ratio, phosphorus, calcium and phosphatase values of blood. An attempt has, however, been made to correlate the importance of each finding with nutritional level of the subject.

This is a preliminary report on the estimation of the total plasma protein (T.P.P.) content of 809 cases of which the results of treatment of 459 cases during their stay in the hospital are given. This estimation of T.P.P. level was worked out within the first week of admission of a patient in this Hospital.

As a control T.P.P. was estimated in 40 normal individuals.

Experimentals

The estimation of total plasma protein of an individual subject was made according to copper sulphate Sp. Gr. method* of Phillips[14] (1943) using the original formula of the authors (Van Slyke *et al*[15], 1930). The specific gravity of different copper sulphate solutions were checked by the use of a specific gravity bottle. The range of the specific gravity of the solution used in this experiment varied by 2·0 ranging from 1015 to 1039.

This method was adopted for the simplicity and quickness as well as accuracy (Nugent *et al*[16], 1934; Weech *et al*[17], 1936 and Van Slyke *et al*[15], 1930). The method is so simple that the estimation can be used by the doctors themselves without the help of a well-equipped laboratory.

Materials for Investigations & Observations

(*a*) Total plasma protein content was estimated in 40 non-tubercular subjects. The minimum level was 6·0 gms. per cent and the maximum was 8·5 gms. per cent.

(*b*) The T.P.P. was estimated in 809 tubercular patients. The maximum was 9·0 gms. per cent whereas the minimum was 3·4 gms. per cent.

The range of variation observed is from 6·0 gms. per cent to 8·5 gms. per cent for the normal individuals. On the basis of this finding the data collected from tubercular patients have been divided into *normal* and *subnormal* groups taking 6·0 gms. per cent of the T.P.P. level as the lowest value for the patients coming under the normal group. Any level below this is grouped under subnormal.

Table I

Observation	*Number of cases*	*Percentage*
T.P.P. level	809	100
T.P.P. level of subnormal group ..	242	30
T.P.P. level of normal group ..	567	70

(*c*) Of the 809 cases studied 30 per cent of cases canfe under subnormal group.

Blood Protein Level and End Results of Treatment

During the study it was found desirable to investigate whether there existed any relation between T.P.P. and the end results of treatment. Here 459 cases are presented who were followed up till their discharge from the hospital. The cases undergoing treatment in the hospital at present and those cases which expired within two weeks of admission have been excluded from the study. 459 cases have been arbitrarily classed into categories of "good" and "bad" end results. The "good cases" include much improved, improved or arrested cases and "bad cases" include death, worse or stationery cases:

Table II

Observation	*No. of cases*	*Good end results*	*Bad end results*
End results studied ..	459	222(48·4%)	237(51·6%)
Subnormal T.P.P. level ..	113	28(24·7%)	85(75·3%)
Normal T.P.P. level ..	346	194(56·0%)	152(44·0%)
Sputum positive cases ..	269	92(34·2%)	177(65·8%)
Sputum negative cases ..	190	130(68·4%)	60(31·6%)

* The principle of the method is that if the specific gravity of plasma is known, the blood proteins can be estimated from the formula. P = 343 (Gp.—1·007) where P = total plasma proteins and Gp. = specific gravity of plasma.

The specific gravity of plasma is measured by the method of Phillips *et al*[14] (1943) by dropping drops of plasma into solutions of copper sulphate of different specific gravities.

The preparation of these copper sulphate specific gravity bottles is a matter requiring considerable care, but it can be done almost anywhere.

Phillips *et al*[18] (1945) give a method of preparing stock solutions of specific gravity 1·100 without even the use of a balance. This method involves two steps: (*a*) the preparation of a saturated solution of copper sulphate by shaking up fine crystals, 453·4 gms. in 625 ml. of distilled water at room temperature, the mixture being shaken vigorously for five minutes and the temperature of the mixture being taken immediately at the end of this five-minute period, the solution being then decanted from the bottle and filtered as quickly as possible. This filtration is best done in two stages, first through a wad of cotton-wool which removes all except a few very fine crystals and then through a coarse filter paper which removes the rest. (*b*) the saturated solution immediately after filtration is diluted with water according to the instructions given, the amount of solution taken for dilution to 1,000 ml. depending upon the temperature of the saturated solution at the moment saturation was ended, *i.e.* immediately after the five minutes' shaking. The stated amount of saturated solution is measured in a 500 ml. cylinder and then transferred to a one-litre volumetric flask, the cylinder being allowed to drain for two minutes. The one-litre volumetric flask is then filled up to the mark with distilled water and inverted ten times for mixing. The mixing results in shrinkage. The flask is allowed to stand for a minute to allow the solution to drain down the neck, and then stoppered and then enough water is added to bring the meniscus back to the mark. The flask is then stoppered and the solution mixed, and the solution is then stored in bulk. This is the stock solution of S.G. 1·100 at room temperature consulting the temperature correction chart of Phillips *et al* (1945).

(2) Different standards of copper sulphate solutions of different S.G. were prepared according to Phillips *et al*[18]—(1945).

(3) The noncoagulant used was Heller and Paul's[19] oxalate mixture of ammonium oxalate 1·2 gm. and 0·8 gm. of potassium oxalate per 100 ml. 0·15 ml. of this solution is taken in each test tube and dried at 37°C. To each dried tube exactly 3 ml. of blood is taken and well shaken. The plasma is taken out of this blood for the experiment.

In Table II it can be seen that 75·3 per cent of cases had 'bad' end results in comparison with 24·7 per cent of "good" end results in cases with subnormal plasma protein. Whereas 44·0 per cent had "bad" end results and 56·0 per cent had "good" end results in normal protein level. This finding may conveniently be compared with the percentage of end results of cases with positive and negative sputum which are given at the lower part of the Table II. One is almost struck by the similarity of the percentage of positive sputum with the percentage of low protein level group.

Noticing this similarity of the end results mentioned above, it was decided to carry the investigation further and study T.P.P. level with positive and negative sputum and note down the end results in each group. The study is given in Table III.

TABLE III

Observation	*No. of cases*	*Good end results*	*Bad end results*
Sub-normal T.P.P. level ..	113	28(24·7%)	85(75·3%)
Positive sputum ..	64	5(7·8%)	59(92·2%)
Negative sputum ..	49	23(47·0%)	26(53·0%)
Normal T.P.P. level ..	346	194(56·0%)	152(44·0%)
Positive sputum ..	205	87(42·4%)	118(57·6%)
Negative sputum ..	141	107(76·0%)	34(24·0%)

It can be seen that the cases have been divided into normal and subnormal groups. Each group has been further divided into two groups of positive and negative sputum. In each of these four sub-groups the end results have been studied:—

(*i*) It can be seen that in the subnormal group with positive sputum the end results are 92·2 per cent 'bad' in comparison with 53·0 per cent 'bad' end results with negative sputum. The comparison is more revealing in 'good' end results of this group. Here 47·0 per cent have 'good' end results with negative sputum and 7·8 per cent 'good' end results with sputum positive cases.

(*ii*) In the normal group also 57·6 per cent have 'bad' end results with positive sputum and 24·0 per cent with negative sputum. In case of 'good' end results the negative sputum group records 76·0 per cent as compared with 42·4 per cent with positive sputum group.

(*iii*) It can further be observed that with the positive sputum in both subnormal and normal T.P.P. levels, the results are 92·2 per cent 'bad' and 7·8 per cent 'good' in sub-normal group as compared with 57·6 per cent 'bad' and 42·4 per cent 'good' in normal protein group.

So the importance of T.P.P. estimation in combination with sputum examination is of better prognostic value than either of them alone.

CONCLUSIONS

From the results of the investigation, it is emphasised here that the T.P.P. estimation is as important as any other routine examination of a tubercular patient. It has been shown that the study of sputum with the T.P.P. level gives a definite idea of the prognosis of a case. If this study be confirmed by other workers, the value of T.P.P. level will be another guide to the clinicians regarding the prognosis. Whether it will lead to a change of the diet of the patients suffering from pulmonary tuberculosis in future is too premature to discuss now. But it is recommended that more stress should be given on the protein content of the food of the tuberculosis case specially with subnormal T.P.P. level.

SUMMARY

1. The T.P.P. level of 40 normal Indians were studied. The minimum value obtained was 6·0 gm. per cent and the maximum value 8·5 gm. per cent.

2. T.P.P. level as well as the sputum examination were made in 809 tubercular Indian subjects. The minimum T.P.P. level was 3·4 gm. per cent and the maximum value was 9·0 gm. per cent. Of these 30·0 per cent cases gave sub-normal T.P.P. level, *e.g.*, below 6·0 gm. per cent.

3. End results of treatment of 459 patients could be studied. In sub-normal protein group 24·7 per cent cases gave 'good' end results whereas in normal group 56·7 per cent cases gave 'good' end results. 68·4 per cent gave 'good' end results with negative sputum and 31·6 per cent cases gave 'good' end results with positive sputum.

4. End results with sub-normal T.P.P. group with positive sputum was 7·8 per cent 'good' and 47·0 per cent 'good' with negative sputum whereas the results with normal T.P.P. was 42·4 per cent 'good' with positive sputum and 76·0 per cent 'good' with negative sputum.

5. It is considered that the estimation of total plasma protein with the presence or absence of tubercle bacilli in sputum give a better prognostic value in cases suffering from pulmonary tuberculosis.

6. In view of the finding, a plea is put forward to increase the protein content in the diet of patients with low plasma protein level.

7. Further investigations are being carried out in this direction.

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NEPHRITIS IN CHILDREN*

G. COELHO, M.B., B.S., B. HY., M.R.C.P., F.C.P.S.,
Honorary Physician, Byramjee Jeejeebhoy Hospital for Children, Bombay.

Lecturer in Diseases of Children, Grant Medical College, Bombay.

Classification

Many have attempted a classification of nephritis. Blackfan (1926) divided it into (1) the acute glomerular and (2) acute tubular. Ellis (1942) divided them into two types—type I with an acute onset and type II with an insidious onset. The correct classification would be the pathological one based on the changes found at autopsy. But a large number do not reach autopsy. As the acute cases recover and the picture of a chronic case may be different, during life one has to be guided by the clinical findings and biochemical investigations.

Clinically the author's series of 38 cases can be divided into three groups: (1) where the first attack has a sudden beginning, 16 out of 38 belong to this group, (2) where the picture develops gradually in the first attack, 7 cases, (3) where the patient comes with a history of previous attacks mostly of the second group —15 out of 22 cases.

When all cases of nephritis are studied the first group is seen largely in children. Ellis (*loc. cit.*) dividing his cases into two types found that of 173 cases of the first type 60 per cent fell within the first two decades and 46 of them were below ten years of age. In my series of 38 cases there were none below 2 years, 12 between 2 and 5, 14 between 5 and 10 and 12 between 10 and 13 years.

Etiology

The exact pathogenesis is still not definite. Because of the high incidence of a previous infection, it has been long considered that this is a causal factor. But actual bacterial invasion of the kidneys has not been proved. It is said that the damage is due to the excretion by the kidneys of toxins produced by the streptococci. Farr produced nephritis in rats by injecting nephrotoxic sera. At first these animals presented a picture of nephrosis, but later when the urea excreting power had been diminished by about 50 per cent, hypertension became an important factor. Histologically these kidneys showed a variety of lesions. There is a period between the acute infection and the nephritis that still needs explanation. Therefore it has been suggested that nephritis is an allergic phenomenon. Schick said this in 1907 and later Press, Longcope and O'Brien demonstrated that a large proportion of cases of acute nephritis gave a marked allergic reaction to intradermally injected filtrates from cultures of streptococci.

Histology

Pathologically the description of the kidney lesions has varied. Volhard said that the tufts were bloodless in the early stages. Osler said that they were filled with leucocytes and red blood cells. They also described changes in the tubules and in the interstitial tissues. In the initial phases there is swelling of the intercapillary substance of the glomerular thickening of the basement membrane and tubular degeneration. Aldrich (1945) reported a complete lack of conformity in his observations; one case showed hyalinisation of the glomeruli even as early as three weeks, another extensive tubular degeneration and hyperaemia in the medullary portions, while in a third the changes in the kidney were negligible. In summarising, he writes, "there is great variation in the extent of renal involvement, the glomeruli show changes which may be generalised and of a highly destructive nature, or localised in a few areas and insignificant in degree. The tubular changes are not severe as a rule." Seven of Ellis' patients died in the acute stage and of these, three died in uraemia, their kidneys showed severe glomerular and tubular changes.

Clinical Findings

Acute Onset.

The child is brought with any one or more of the following complaints:

1. Scanty urine, 2. Red urine, 3. Puffiness of face, especially round the eyes in the morning.

With these basic symptoms there may be 1. Fever, 2. Headache, 3. Vomiting, 4. Drowsiness, 5. Convulsions, 6. Loss of vision.

On examination the child may show:

I. *Oedema*—Oedema of face, oedema of lower extremities, generalised anasarca of a variable degree, ascites. The first one is present in 100 per cent of cases, the second is in 80 per cent and the remaining in less than half. Ascites is very rare. When oedema is generalised it does not pit on pressure but is firm to the feel. This is best seen on the thighs and back. A certain degree of such oedema may not be detected by the eye but can be detected by the daily gain in weight. "The brain in acute glomerular nephritis is firm and tense and the convolutions flattened" (Blackfan, 1926).

2. *Infection*—Many writers have described an infection which precedes an attack of haemorrhagic Bright's disease. Addis writes, "a clinician's haemorrhagic Bright's Disease is a disease within a disease," as the manifestations of the involvement of the kidney appear even during the period of convalescence. Ellis (*loc. cit.*) recorded a history of previous infection in 84 per cent of his cases, and these suffered from tonsillitis, sore throat, cold, influenza. Blackfan (*loc. cit.*) recovered a haemolytic streptococcus from the rhinopharynx of 14 out of his 24 patients. Besides the infections of throat, infection of the skin like impetigo and boils may also precede the nephritis. In our cases six had clinical signs of infection of the upper respiratory tract and five had skin infection, scabies with secondary infection. This skin

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infection was also seen in those children who came with a previous history of oedema, and who during the attack for which they sought admission had extensive oedema—five cases.

3. *Urine*—(*a*) No urine may be passed for over 24 hours. Most of the children pass very much less urine than normal. It may be frank blood—two cases. It may be smoky—(three cases) in appearance or it may be dark or coffee colour—three cases. As diuresis sets in the thick blood appearance may change to light pink.

(*b*) Albumin is a constant finding. It may be little, due to the cells in the urine or it may be in excess.

(*c*) Red blood cells, white blood cells and casts are essential for a diagnosis of acute nephritis. They are present in abundance in all acute cases. Casts of the varied types are always present, cellular and granular predominating.

4. *Blood Pressure*—An increase in the systolic and diastolic pressure is a constant finding in these cases. Hypertension, haematuria and hard oedema form the diagnostic triad in this condition. A systolic pressure above 115 in a child of six years is considered significant. I have seen systolic pressure as high as 250 mm. of mercury in a girl of 4 years. The rise in the pressure is sometimes dramatic. Pressures about 150 mm. of mercury are average for all ages. Even with systolic pressures ranging between 150 and 200 mm. the children play about and do not show any discomfort. But a high blood pressure may be associated with the following manifestations of encephalopathy.

(*a*) Vomiting, which may be persistent, projectile, and have no relation to food.

(*b*) Headache.

(*c*) Drowsiness.

(*d*) A cloudy mind with loss of correct appreciation of surroundings.

(*e*) Coma.

(*f*) Convulsions.

These and a rising blood pressure are danger signals. They may arise at any stage of the illness and have no relationship to the haematuria or anuria. Rarely there may be blindness with a blood urine and a high blood pressure. I have seen only one case in twenty years.

A rising blood pressure precedes or is closely associated with the development of cerebral symptoms. Volhard and Fahr were not certain as to which was primary and which secondary. Marriott (cited by Blackfan, 1926) suggested that the arterial hypertension is the result of capillary constriction caused by a toxin, and this toxin was responsible for the uraemia. Kylin (cited by Blackfan, 1926) was also of the opinion that the hypertension was due to capillary constriction. But Boas (cited by Blackfan, 1926) found capillary pressure normal in a number of cases of acute glomerular nephritis. Cushing experimenting with dogs found that the arterial pressure rose as the intracranial pressure increased. Blackfan (*loc. cit.*) reported a case where an oedematous brain was found incarcerated in the cranial vault. In the cases reported by him he observed that the decrease of oedema and lowering of the blood pressure were coincident with the disappearance of cerebral symptoms, and that the blood pressure fell with the fading away of the oedema. He writes "it is not to be denied that alterations in the capillaries may be the primary cause of the oedema," but the cerebral symptoms may be explained on the basis of cerebral oedema and increased intracranial tension. In support of this suggestion he cites the therapeutic results obtained by injections of hypertonic saline and one per cent solution of magnesium sulphate in these cases. Hypertonic saline intravenously reduces the volume of the brain. Ellis (*loc. cit.*) did not observe spasm of the retinal vessels in his cases of hypertensive encephalopathy. Neither did he find any increased intracranial pressure. But Blackfan (*loc. cit.*) suggests that the absence of increased intracranial pressure when a lumbar puncture is done may be due to the oedematous brain interfering with the free circulation of the cerebrospinal fluid.

5. *Fever* may or may not be present. Six children had fever. It is found when there is an acute infection of the throat, or an infected condition of the skin, though a number of children with multiple abscesses and heavy secondary infection after scabies do not have any pyrexia. There may be a frank acute haematuria without any temperature.

6. *Blood chemistry, retention of nitrogenous products*—There is an increase in the blood urea which ranges between 30 and 80 mg. per 100 cc. in the majority cases. Still neither the oedema nor the oliguria, nor the general symptoms are always parallel with the degree of retention of nitrogenous products. The blood cholesterol is not affected. The plasma proteins are generally not diminished. Ellis (*loc. cit.*) found that the plasma proteins were less than 6 per cent in one-third of his cases. Blackfan (*loc. cit.*) did not find them reduced, neither did Lyttle (1938).

7. *Haemopoietic changes*—In the early stages there is no change in the red blood cells nor in the Hb. but with the persistence of the loss of blood in the urine there is a fall in the red blood cells and Hb. Two of my cases were saved with blood transfusions. The white cells count reflects the infection if present anywhere.

8. *Heart*—Toxic myocarditis is one of the complications of this condition. Enlarged heart has been found in some cases on screening. Enlargement of the heart and alteration of the heart sounds are the first signs. This is a grave complication and may cause death.

Diagnosis

I shall only mention a few conditions with bloody or smoky urine that should be remembered these days:

1. After sulfa drugs haematuria may occur due to the damage done by the crystals. But under the microscope one sees only red blood cells. There are no casts. The blood urea is not raised.

2. Blackwater fever. This is very rare in children in Bombay. Cases that were referred to

the hospital as blackwater fever turned out to be acute nephritis. The diagnosis should be made on the paucity of red blood cells and the presence of methaemoglobin in the urine. This combined with the fever with rigors clinches the diagnosis. The blood pressure is not raised in blackwater fever.

3. Stone in the kidney, tubercular kidney may cause a sudden haematuria. The diagnosis is built with further observation.

4. Administration of urotropine. To-day this drug is not used as much as before. But there are still old practitioners who are conservative and use it in urinary infections. Excessive use of urotropine may cause haematuria.

5. Angioneurotic oedema. This comes on suddenly but the urine is free.

6. To decide whether it is an acute or chronic glomerulo-nephritis is sometimes difficult. It is true history is a guide, but our patients do not give a correct one very often. An acute attack may be seen during a chronic stage. Following the patient for some days one notices an improvement in volume of urine excreted, a fall in the blood pressure, a decrease in the red cells in the urine. After that the progress is at a standstill. The oedema becomes chronic. The other is the differentiation between nephrosis. In a straightforward case the urine would not contain any red blood cells, there would be no rise in blood pressure nor blood urea and the blood cholesterol would be raised and the serum albumin would be low. The oedema is very marked in nephrosis. Sometimes acute glomerulo-nephritis may appear as a complication of nephrosis. Then there will be a haematuria, hypertension and an increase in blood urea.

The other condition that is intriguing is benign albuminuria, orthostatic, physiologic etc. Though Lyttle (*loc. cit.*) says that if urine is examined repeatedly albuminuria is found in 12-68 per cent of all children, my experience has been otherwise. I find it is rare, barring the febrile albumin, though I have not examined the urine repeatedly.

Progress

With hypertension the first sign of improvement is a fall in the blood pressure. A diuresis sets in when the blood pressure comes down to about 120. With the diuresis the oedema disappears gradually. A fall in weight is the best guide. It takes on an average eight days for it to disappear.

But the blood and casts take a long time to disappear. Our patients seldom stay in the hospital for more than three weeks if they have no oedema but when they leave they are not cured. Their blood urea comes down, but their urine still contains red cells and casts. Our follow-up is very poor and I am sorry I cannot say much about them.

These incompletely cured children are candidates for chronic nephritis in adults. Hence a complete cure should be the aim. Still the treatment is symptomatic and not quite effective. Our knowledge of its pathogenicity is limited.

Prognosis

The haematuric nephritis with hypertension following an acute infection has a better prognosis as regards recovery than the other types.

During the course of the illness, myocarditis and a rapidly rising blood pressure are bad prognostic signs.

Though naked eye haematuria may disappear in two weeks time yet traces of albumin and a few red cells may persist as long as six months.

Treatment

1. *Rest in bed*—This is considered by all as the most important part of the treatment. Aldrich, Ellis both lay great stress on rest. My difficulty has been in enforcing this rest. Our children, whether in hospital or at home, are seldom in bed.

2. *Magnesium sulphate*—In all cases with hypertension magnesium sulphate is the sheet anchor of treatment. It is given orally, intramuscularly, intravenously. Orally a saturated solution is used containing four drachms of magnesium sulphate in an ounce of water. This must be appropriately sweetened and coloured to make it agreeable. The solvent should contain at least three drachms of syrup to each ounce. This is the route in all cases when the patient is conscious and the blood pressure is below 150. When the blood pressure is over 150 and is fast approaching 200, when there are signs of encephalopathy the intravenous route is desirable as it brings down the blood pressure promptly. For this either 1 per cent solution in 5 per cent glucose or 4 per cent in 5 per cent glucose is used. If the former, 5 cc. for each pound weight and if the latter, 1·25 cc. per pound weight is the dose for each injection. The injections must be given slowly, not more than 2 cc. per minute and when the stronger solution is given blood pressure should be measured on the other arm, as there is a danger of its falling very rapidly. If facilities are available it may be given as a drip; otherwise it may be given by a 20 cc. syringe and a two-way stopcock. The effects of intravenous magnesium sulphate on a patient with symptoms of encephalopathy are dramatic. There should be no hesitation in using this as the first line in treatment.

When the veins are collapsed or there is a difficulty in getting them magnesium sulphate may be injected intramuscularly in concentration of 25 per cent solution. These solutions are readily available. The intravenous and intramuscular injections may be repeated every 8 hours till the blood pressure comes below 150 mm. Hg.

The action of magnesium sulphate may be due to its sedative action, releasing the capillary spasm or to a change of the osmotic relationship between the blood and tissues of the brain. Blackfan (*loc. cit.*) discussing these possibilities does not favour the sedative action as he thinks that the dose administered is too small to exert this physiological action. He suggests that the beneficial action may be due "to an increase in the total

concentration of the electrolytes in the blood which thus alters the osmotic relationship between the blood and tissues." Though Blackfan writes of the cathartic action of magnesium sulphate when administered by mouth, our experience has been different. Half an ounce of saturated magnesium sulphate administerered four hourly to children 6 to 10 years of age has not resulted in more than two stools a day so long as the blood pressure has been high.

3. *Control of Infection*—To combat any infection, be it of the upper respiratory tract or the skin sulfa drugs and penicillin are used. My use of the sulfa drugs has been from the days of proseptasine. Since then I have passed from sulfanilamide to sulfapyridine and now to sulfadiazine. Though crystalluria and haematuria have been mentioned by various authors I have been fortunate in not having met with a single case. Penicillin is of recent introduction. All these antiseptics and antibiotics are given for 4 days at least. Diaphoretics, diuretics, electric cradles, hot air baths and any method that increases fluid loss through the skin is contraindicated as it increases the concentration of toxins.

4. *Fluids*—This is still a matter of controversy. There are yet physicians who want to save the kidney all possible work and rest it. Fluids have been restricted and are being restricted even now. Ellis (*loc. cit.*) is in favour of restricting the fluid intake to one pint of fruit juice and even Christian (1934) is in favour of fruit juices, carbohydrates with restricted fluids in the first week of a very acute nephritis. But Neuburgh (1936) wrote "it has been universally taught that blockage of the kidneys is the cause of nephritic oedema. According to that doctrine to get rid of the oedema one must remove the water by other routes and at the same time permit as little water as possible to enter the body. Only a few experiments were needed to show the utter fallacy of these earlier beliefs and to indicate the shocking amount of harm that their acceptance has worked. Examination of data shows that the kidneys of the oedematous subject were able to secrete a very large amount of urine containing a normal amount of solids as soon as he was permitted to drink a sufficient amount of water." From the year 1933 I have not restricted the fluid intake. I started it as the lesser of the two evils as it was impossible to restrict the fluid intake in the hospital patients who either helped themselves liberally from a water tap or were helped by the relatives. This unrestricted fluid intake did not do them any harm. Since then there is full freedom to drink as much as they like; in fact, they are coaxed to take at least 2½ ounces per pound body weight per day, irrespective of the state of the oedema.

Aldrich (*loc. cit.*) who is a strong supporter of liberal fluids, writes "since that time (when Breunemann drew his attention to it) water has been denied to no patient and we have usually urged fluids. No patient so treated has died of acute post-infectious haemorrhagic nephritis in this period."

What should be the nature of fluids? Most of the children like fruit juices or coloured aerated water and these I place on high priority. With this rice conjee water may be allowed.

5. *Diet*—Christian (*loc. cit.*) writing on the types of nephritis and their management says, "Ideas as to the management of a developed nephritis of any type have been considerably modified in recent years. We recognise that the disease is by no means limited to the kidney. Now practitioners are more influenced in their plan of treatment by consideration of the patient as a whole than in the past. Now they consider less dietary constituents that theoretically increase the work of the kidney and are more concerned with the nutrition of the patient at a high level . . . . . rapidly the diet should be changed in amount and variety with only moderate restriction of protein, salt and fluid, a diet not very different actually from a normal diet, free from any excesses." Once fluids were allowed, it did not do away entirely with the problem of feeding. Most of these children are not acutely ill. They still have an appetite and hunger for food. Here again the time-honoured custom is to ban solids, particularly proteins for a long time.

The next item that was introduced in the dietary by me was fruits. Bananas, papaya, chikoos, guavas, water-melons were next allowed. These have no proteins, and so there could be no objection. I am talking retrospectively. These children did well. Then we added diluted milk and rice and vegetables. This too made no difference to the course. If protein could be given as milk why not protein in other forms. Children, some of them have an aversion to milk. So I introduced meat in the dietary. For the last two years a full diet is prescribed, without restricting the quality or the quantity. The full diet at the hospital consists of egg, bread and butter, milky coffee, bananas in the morning, bone soup, a meat dish, two vegetables, a custard pudding, a banana or orange at noon, milky tea in the afternoon, rice and dal or rice and chapatis at night. They made no worse recovery than the others.

Boyd (1937) writes "our therapeutic approach is hampered because of ignorance as to the pathologic physiology involved in its causation. Often empirical therapy has been based on a misinterpretation of physical or laboratory signs. For example, when abnormality of the kidney or of the urinary constituents has been apparent, it has been rationalised that the kidney should be put at rest; that substances requiring elimination through the kidney should be withheld from the diet. This has served as the rational for the limitation of protein foods, salt and water in the treatment of albuminuria, oedema, haematuria or manifest renal disease of any type."

Aldrich (*loc. cit.*) writes that "a careful check of results does not show that those restricted did any better than those who were allowed protein."

6. *Other Treatment*—For encephalopathy magnesium sulphate is the primary treatment. Neither venesection nor a lumbar puncture is done these days.

For the control of convulsions any sedative is used. I have found the quick acting sedative Seconal Sodium particularly useful. Cupping and sweating have no place in the treatment of nephritis to-day.

Chronic Nephritis

Children of group two are of two types. One, the chronic glumerulo-nephritis, come with a story that without any recent infection their feet got swollen first and then the whole body. They have no fever. The quantity of urine is diminished and is in inverse porportion to the oedema. The oedema pits on pressure. When extreme the child may add three pounds to its weight daily. The scrotum or vulva are very swollen, and the skin over these areas and in the feet is translucent. The child is unable to open the eyes. Such a child looks miserable.

The urine is loaded with albumin. There are red blood cells, white blood cells and casts, but these are fewer than in the previous condition.

The blood pressure does not rise above normal. vomiting, headache and other signs of encephalopathy are absent.

With increasing oedema, fluids accumulate in the abdomen. While ascites has been common in this condition, hydrothorax and fluid in the pericardium have been rare in my experience.

With the ascites the child complains of pain in the abdomen and when there is pyrexia with it, the possibility of peritonitis must be borne in mind.

When the skin is tense, there may be an erysipelas infection of the skin.

The blood urea is not raised, but the blood cholesterol may be. There is always a certain degree of anaemia. The plasma proteins are diminished.

Progress:

The course may extend over three to four weeks. The severe oedema may last well over ten days.

During this period there may be a rise of temperature and then there may be haematuria and hypertension, or this period of pyrexia may be followed by improvement in the general condition and disappearance of oedema.

Even after the disappearance of oedema, the urine contains albumin in a good quantity and epithelial cells and casts.

Sometimes the improvement occurs, and no reason can be ascribed to it.

Similarly there may be a relapse, without any apparent reason. In some cases, of course, there is an intercurrent infection.

Prognosis is unsatisfactory, as the course is one of progressive renal destruction.

In spite of voluminous literature, I do not think we have come to any conclusion regarding nephrosis. Though Lyttle and Aldrich considered nephrosis a distinct entity yet while Aldrich discards a diagnosis of nephrosis if hypertension and haematuria are present, Lyttle states that moderate hypertension and microscopic or even gross haematuria are seen with anatomically proved nephrosis. Ellis does not think that this concent of nephrosis as a separate identity is justified as "if the patient with so-called 'nephrosis' does not die in the early stages and does not recover, he ultimately becomes indistinguishable from a patient with Type II nephritis. This effort to diagnose this condition is mainly because of the prognosis, as nephrosis with albuminuria, oedema, non-retention of nitrogenous products and a high cholesterol content of the blood, are said to have a better prognosis as some of them recover.

The treatment of the chronic patient is unsatisfactory. Though sometimes an upper respiratory infection may flare up an acute state. yet it is not always so; on the contrary, sometimes an acute infection with a high temperature has brought about a diuresis and cleared the oedema. This has tempted me to try pyrexial therapy in these cases, but the results have not been encouraging.

In the treatment of the chronic case magnesium sulphate has no place. Administered by any route it does not help the clinical condition. I have tried large doses of alkalies with no success. When the scrotum or vulva is oedematous to a bursting point one is naturally anxious. 25 per cent solution of glucose intravenously and calcium chloride orally sometimes help. Then suddenly diuresis occurs and everything seems brighter.

These patients are given a full diet, and plenty of vitamins. This diet should contain more of protein. This is given as milk, curds, meat and fish. The optimum quantity of protein is 3 Gm. per kilogram weight of body per day. This diet should in the earlier stages be salt-free. This does not mean the complete absence of salt, but a minimal amount. If the quantity of salt be tapered down in about a fortnight there is not much opposition from the child to such a diet. Fluids should not be restricted.

Blood transfusions and concentrated plasma intravenously have not helped.

Recently amino acids and protein hydrolysates are available. In spite of all attempts they are not

palatable. If a child can take meat, fish and curds I prefer him to take these rather than these manufactured products. My experience with intravenous administration of protein hydrolysate has been disastrous. One patient died, and three nearly died.

It is rational to search for foci of infection and remove them. The tonsils and adenoids are freely removed. The benefits of this operation do not come up to expectations in the majority of cases. In our patients an infection of the skin preceded the nephritis oftener than infection of the upper respiratory tract.

There is no method of prevention of acute nephritis. Tonsillectomy was once recommended as a prophylactic measure but Illingworth showed that tonsillectomy does not prevent nephritis, but may predispose to it and that it does not cure nor arrest its progress to a chronic stage. To-day with the sulfa drugs and penicillin we have powerful means of combating infection. Yet the incidence of nephritis is about the same.

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B. C. G. VACCINATION

KRISHAN KUMAR, L.S.M.F.,

Medical Officer-in-Charge, Tuberculosis Clinic,

Civil Hospital, Ambala City

The subject of B.C.G. vaccination has become very important for various reasons. The vaccine is playing an important part in the anti-tuberculosis campaign in the western countries.* The Government of India is introducing B.C.G. vaccination in India on a large scale.

*B. C. G. Vaccination is used extensively only in Scandinavian countries. WHO is now organising mass inoculation in Greece and other war-damaged countries of Europe.

Immunity in Tuberculosis

Immunity, in tuberculosis as in other infections, is the specific increase in the fighting powers against the infective agents which the organism acquires as a result of an infection whether this be produced naturally or by artificial means. A natural primary infection in infants, if resistance is low *carries* away the patient by an extensive primary complex with widespread dissemination. But when resistance is of a high order and if the infection is not heavy, it produces a partial immunity which helps to localise the organisms of subsequent infection and gives us the picture of re-infection type of tuberculosis.

By virtue of its association with allergy, it can be detected by means of a tuberculin test. Recently it has been recommended that hospitals and sanatoria should not employ tuberculin negative staff (*i.e.* those who do not possess this natural immunity) unless certain principles embodying special attention and supervision can be carried out in detail. Experimentally, too, such tuberculo-immunity can be produced in man, guinea-pigs and cattle by infection with either virulent or avirulent human or bovine strains of tubercle bacillus.

B.C.G. Vaccine

Ever since the discovery of the tubercle bacillus by Robert Koch in 1882, attempts have been made to immunise different species of animals by inoculating bacillary extracts or bacillary bodies killed by physical or chemical methods, but they failed. Having ineffectively tried immunization experiments with dead bacilli which acted as ineffective antigens and inefficient in producing anti-bodies, the thoughts of prominent workers, notably of the late Professor Calmette, were directed to the finding of a strain of bacillus which had attained permanent attenuation or had lost its virulence permanently. About 1908, Calmette and his associate Guerin, who were working with a virulent bovine strain, began to grow it on a cooked potato medium containing ox-bile in 5 per cent glycerine broth. After 13 years of continual subcultures, at intervals of every 21 to 25 days, representing 230 passages, the strain was found to be incapable of producing inoculable tubercles in guineapigs, even after the administration of 1-2 cgms. The experiments have since been repeated on other laboratory animals, cattle, anthropoid apes, and it has been shown that the introduction of this biologically altered strain by oral, subcutaneous, intradermic or intravenous routes have failed to produce inoculable disease, and, that, on the other hand, it was found to confer a state of resistance, varying according to the susceptibility to tuberculosis of the various animal species. A strain was thus developed which had "fixed" characters, incapable of being made virulent again, either on culture or on animal passage. Large doses introduced into man or animals might produce abscesses, but pus from these abscesses has hitherto failed to produce disease in other inoculated animals. I need not go into the procedure of maintenance of the culture and of the

preparation of the vaccine, but I should like to make it clear that the freshly made vaccine conserves its vitality only up to 10 days, after which the bacilli begin to die rapidly. The idea is to introduce a sufficient number of living avirulent bacilli into the bodies of the uninfected individuals, which are retained within the body for a certain length of time and are subsequently gradually eliminated through various channels in the usual course of events. The human or animal organism remains resistant to re-infection so long as living bacilli are found in the body.

Protection Experiments with B.C.G.

So far as protection experiments with B.C.G. in India are concerned they are, practically speaking, nil. As far as I am aware, it is only Dr. A. C. Ukil of Calcutta who inoculated in 1933 two boys of Bata Shoe Company who were found negative to tuberculin out of a group of 20, with B.C.G. vaccine prepared in his laboratory from a strain supplied by the late Professor Calmette. These boys have maintained good health so far.

However, a huge amount of literature has been published in almost all the advanced countries of the world, except Great Britain. This is partly due to the traditional conservatism of British workers and partly to the unfortunate accident at Lubeck (Germany) caused by the contamination of the B.C.G. vaccine with a virulent strain through the carelessness of the laboratory workers. However, official inertia in Great Britain has ended. Sir Wilson Jameson, the Chief Medical Officer to the Ministry of Health, has agreed to take steps to prepare a suitable vaccine and give it a trial on suitable groups of population.

Since 1924, the B.C.G. vaccination in man and cattle has been tried in various countries. The classical studies of Heimbeck (1928) in Norway[1] have provided the soundest evidence we have of what B.C.G. can do. The experiment was done on hospital nurses who formed a particularly suitable group, as some of them were found to be infected, others not infected, while at the same time constituting a class in much greater need of protection against tuberculosis than the population as a whole. The nurses were Mantoux-tested on entry and it was observed that those who were 'negative' more often developed tuberculosis than those who were originally 'positive'. Immunization of negative reactors with B.C.G. reduced the morbidity in one series from 17·6 to 2·6 per cent. Similar effects were observed in medical students.

In a study by Rosenthal and others (1928)[2] which represents the longest continuous experiment with B.C.G. vaccination in the United States, it has been stated that not only were the morbidity and mortality from tuberculosis appreciably reduced after vaccination, but the extent, severity, duration of sequelae of the pulmonary lesions, when they did occur in the vaccinated, differed from those of the non-vaccinated. In the former, such lesions were less extensive, of shorter duration and calcified earlier.

Thousands of vaccinations conducted in different countries have established that the general mortality is relatively lower (by about 50 per cent) [3. 4. 5. 6.] in the vaccinated than among the non-vaccinated. Post-mortems of vaccinated children dying of other diseases than tuberculosis have proved the inocuity of the B.C.G. vaccine. The lower general death rate among the vaccinated is a further point against the regaining of the virulence by B.C.G. at any subsequent period.

Selection of Candidates for B.C.G.

In order not to offer a chance to reactivate dormant lesions, the vaccine should be given only to those who would prove strictly 'negative' to tuberculin tests, that is to say, to those who have not had as yet infection with tubercle bacilli.

The selection of candidates for B.C.G. vaccination is made by one of the following methods of tuberculin testing:

1. Those who prove negative to Pirquet test twice at intervals of a week.

2. Those who prove negative to Mantoux test with both 0·1 and 1 mg. of old tuberculin.

3. Those who prove negative to 0·00002 and 0·005 mg. of P.P.D.

Whatever the method chosen, the same brand of tuberculin should be employed in all groups. Whenever possible, the chest should be x-rayed, as a small percentage of negative reactors may exhibit active tubercular lesions by skiagraphy.

The newborn can be given vaccine within the first ten days, when the question of tuberculin-testing does not arise.

Technique of Administration of B.C.G.

(*a*) Oral—This method is specially suitable for the newborn within the first ten days of life. 1 cg. (approximately 400,000,000 bacilli) of freshly emulsified cultures of B.C.G. are given in empty stomach within the first ten days of life, either on the 4th, 6th or 8th day or the 5th, 7th or 9th day after birth. It has been given up.

(*b*) Subcutaneous and intradermal injections—this is the most suitable method for infants and children who react negatively to tuberculin tests.

For subcutaneous injections, 1 to 2 cc. of the emulsion containing 1/100 mg. per cc. is given, according to age. Sometimes an abscess develops at the site of injection but this heals easily.

For intradermic vaccination, 0·1 cc. of the vaccine containing 0·1 to 0·15 mg. of B.C.G. culture is injected slowly into the dermis through a tubercuin syringe and a 26-gauge platinum needle. 48 hours later a sharply defined nodule appears, measuring approximately 4 mm. in diameter by 1 mm. in height. A central area of softening sometimes occurs 3 to 4 weeks after vaccination leading to ulceration in the 4th week in 75 per cent. of cases, which, however, heals in another 4 to 8 weeks leaving a depressed soft scar.

(*c*) Multiple Puncture Method—The drawback of the method of subcutaneous or intradermic injection, leading to the production of an abscess or necrosed spot after inoculation of the vaccine, has recently been overcome by the scarification method or multiple punctures of the skin, to which the vaccine is applied. This method produces only tumefaction of the skin but no abscess formation and no ulceration and appears to be more effective than the subcutaneous or intradermic injection. This method is mostly used now.*

95 per cent of the individuals become tuberculin positive. This percentage fades gradually and it has been noted that, one year after vaccination, about 93 per cent react to tuberculin. This percentage maintains up to 3 years and in some up to 5 years.

It is considered desirable that highly exposed infants should be removed from source of infection for 6 weeks before B.C.G. vaccination. The vaccinated person also should be protected against exposure to infection by tubercle bacilli until they become tuberculin positive. The pre- and post-vaccinal removal from contact with infection is important to the success of B.C.G. as, should vaccination coincide with the development of a natural infection, the general public might think the disease was caused by the vaccine.

Duration of Immunity Conferred by B.C.G.

Those who receive vaccination by mouth begin to react to tuberculin at the end of the second month; those who get the subcutaneous or intradermic inoculation react more easily to tuberculin. The immunity conferred by these inoculations lasts on an average about 5 years. It has, therefore, been suggested to repeat the vaccination at the end of the third year, seventh year and fifteenth year. Those who have been able to withstand up to the 15th year may be considered to be able to resist tuberculosis in later life. In the case of infants reared in a tubercular environment, it is better to re-inoculate at the end of the 1st and the 3rd year. (If the child is found to revert to non-reactor).

Groups of People for whom the Vaccination is Specially Desirable

The ultimate aim, of course, should be to extend the vaccination to the whole of the tuberculin negative population in this country. But, to start with, the following group should be chosen.

1. Newborns particularly in tuberculous households;

2. All tuberculin negative adolescents and adults who come into large towns or industrial centres for education, employment or otherwise;

3. All tuberculin negative adolescents and adults joining hospital service, the Army, Navy and Police forces.

Need for Its Use in India

It is generally accepted that when an agricultural country becomes industrialized, the incidence of tuberculous disease and deaths increase, until it is controlled by various measures. Today, India is on the threshold of extensive industrialization, and a large majority of the workers will have to be drawn from rural areas from an open and free atmosphere of the country to the congested and unhygienic condition of an industrial town. In this predominantly agricultural country, where the tuberculin negative population is enormous, the urbanisation and industrialization will cause a further increase in the rising trend of tuberculosis morbidity and mortality. B.C.G. vaccination, in combination with other prophylactic measures, will go a long way in preventing history repeating itself in this country.

Criticism of B.C.G.

I think it would not be fair on my part if I, while quoting evidence in support of the utility of B.C.G., did not refer to some of the criticism levelled against it. I will quote here some views of a distinguished authority, Professor Wilson[7], from his article in British Medical Journal which is highly critical of the use of B.C.G. It must be stated, however, that some of the arguments be uses against the claims of those who have used the vaccine are open to criticism.

Professor Wilson is of the opinion that most of the previous work done by Calmette, Wallgren, Rosenthal, Lavine and Heimbeck is not considered acceptable as proving that B.C.G. has value of controls. He has also discussed the disadvantages that the use of B.C.G. entails and the difficulties which must be faced by those contemplating the use of the vaccine. These may be summarized as:

1. B.C.G. is a live vaccine and must always be regarded as such throughout its preparation and use.

2. The virulence of the vaccine is not fixed.

3. The infants of tuberculous mothers must be separated for a period at birth.

4. Segregation both before and after vaccination of all individuals likely to receive natural infection is necessary.

* In Scandinavian countries intradermal method is universally used. So also in India so far.

5. Infants segregated in nurseries may be exposed to cross infection and develop other illnesses.

6. Revaccination is necessary when the B.C.G. organisms die out in the human body.

7. It is possible that introduction of B.C.G. vaccination may result in a partial substitution for the highly reliable prophylactic procedures such as vaccination against small-pox and diphtheria.

Other arguments given against the use of B.C.G. by others are:—

1. Its use would destroy the value of a most potent weapon in finding those who are infected with tuberculosis, namely, the tuberculin test.

2. Its immunizing action is not able to combat massive doses of tubercule bacilli.

3. Unwarranted sense of security by the public in B.C.G. may cause cessation in interest in fundamental procedures by which so much has been accomplished.

Conclusion

The protective value of B.C.G. vaccination correctly carried out has been proved and merits the growing interest and confidence put in it by many physicians all over the world, but its value must not be exaggerated. B.C.G. has a definite place in the specific control of tuberculosis but it should not be used as an easy way out or as an excuse to neglect eradication of foci of infection. We must admit that various measures such as measures of community welfare, case detection, isolation and treatment of open cases, rehabilitation, health education and propaganda, and legislation which were responsible for a decline in tuberculosis morbidity and mortality in the western countries, are of supreme importance in solving the major health problem of tuberculosis; but we must not forget that B.C.G. is an important addition to these fundamental procedures.

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SPECIAL ARTICLES

I

SYNTHESIS OF MEDICINE

AMIRCHAND, F.R.C.P.E., LT.-COL., I.M.S. (RETD.),

Simla

The long awaited report of the Committee on Indigenous Systems of Medicine is out. It has not belied some of the rumours that were afloat some time ago. Taking its cue from the inaugural address of the Hon'ble member then, Raja Ghazanfar Ali, it has considered "the possibility of working out a synthesis of the Indigenous and the Western System of medicine" and has come to the conclusion that "in its considered opinion synthesis is not only possible but practicable." It believes "that while Indian medicine can take much of practical value from the Western medicine, the latter can also learn much from the philosophic background of Indian system, its comprehensiveness—and the knowledge of truth gained by the use of supra-sensory perception." The students are to be given "a knowledge imbued with the spirit of the ancient Indian medicine and well-equipped with modern science." "Experts of Indian and Western medicine, working side by side, are to check and verify the various hypotheses and theories either rejecting or harmonizing them", and if the theories are such as could neither be rejected nor reconciled they are to be "used as parallel hypotheses". The students of medicine in India will, in future, be required, if the recommendations of the Committee are accepted, to have "working knowledge of Sanskrit and Arabic for Ayurvedic and Unani systems respectively and sound knowledge of English." This will, evidently, be in addition to the knowledge of the Provincial or Regional language and the National language. In the curriculum of studies suggested by the Committee are included, along with a few other subjects, "Indian anatomy, Western anatomy, Ayurvedic physiology, Western physiology, Indian materia medica, Western materia medica, Indian hygiene, Western hygiene and public health, Indian pathology and diagnosis, Western pathology and bacteriology, Indian toxicology, Western toxicology, Indian medicine, Western medicine, Indian surgery, Western surgery, Indian diseases of eye, ear, nose and throat, Western diseases of eye, ear, nose and throat, Indian obstetrics, gynaecology and pediatrics and Western midwifery, gynaecology and pediatrics" which are to be taught "side by side in both types of Institutions", *i.e.,* Indian and Western. This evidently takes it for granted that there are two anatomies, two physiologies, two pathologies and so on.

It is the aim of the scientific system of medicine "to put together the best" not only "in both the Indian and the Western systems," as recommended by the Committee but in all the systems in the world, "so as to evolve one unified system for the advancement of medicine and the benefit of mankind." The modern medical science, the so-called Western medicine or allopathy, is the result of such efforts. It is nothing

but the indigenous systems shaped and synthesised in to a scientific form after labours of more than four centuries. It is an all comprehensive science into the corpus of which all available scientific medical knowledge has been absorbed and will be absorbed in future but only that that will be found by research and experimentation conducted on the approved scientific lines of today, and not of bygone ages, to be the best and scientific.

It is not clear from the report of the Committee how the synthesis suggested by it will be superior to and more scientific than the synthesis which has already been evolved and is in the process of continuous evolution. If those hypotheses and theories which can neither be rejected nor harmonized or reconciled are to be perpetuated as parallel hypotheses and if even after synthesis, the Ayurvedic and Unani systems are to retain their identities and not to merge into one scientific system, not only for India, but for the whole world, it will not be consistent with the belief of the Committee that "there cannot be separate systems of Western or Indian medicine and that science is universal and medical science is no exception to this rule." The larger system *i.e.*, the system which contains more scientific truth, is to absorb the smaller if after integration or synthesis of the various systems prevalent in the world one scientific system is to be evolved. Only one system thus evolved will survive, the others must lose their separate identities. Synthesis means absorption into the corpus of scientific medicine for purposes of evolution of an all comprehensive system to be utilised by the whole world but what has been suggested by the Committee falls far short of that. In fact it is no synthesis in the real sense.

Preference alone of the people to Indian medicine and method of treatment is considered by the Committee a good justification for "the fullest support and patronage of the State." But superstition and witchcraft also are popular! If patrons of Ayurveda and Unani are found among the intelligentia and the rich and even among the practitioners of Western medicine" so are patrons of anti-vaccination and anti-vivisection and of Christian science and Faith and Prayer healing amongst similar classes in India as well as in the West.

One thing is astonishing. Even those members of the Committee who are students of the Western medical science have accepted the definition of the scope of modern medicine, given in Dorland's medical dictionary, as the "art or science of healing disease, especially the healing of disease by administration of internal remedies", and have evidently ignored the stress the modern medical science lays on preventive medicine, industrial medicine, social medicine, nutrition, positive health and physical medicine and the importance of the entire field of surgery and obstetrics. To say that Ayurveda and Tibbi, which have no preventive medicine, go beyond the scope of modern medicine" is not correct, to say the least of it. In the works of Avicenna, and before him the Ayurvedic masters, one has to look in vain for as effective preventive measures against small-pox, plague, cholera, diphtheria, tetanus, rabies, malaria, enteric fevers, etc., etc., as in the modern medical science.

In dealing with the problem of the medical relief in rural areas much weight has been attached to the economic factor. Rural requirements of medical relief are held to be different from the urban. It is even accepted that "most of the ailments that commonly trouble the villager are of a comparatively simple kind and are amenable to simple remedies and do not require highly skilled practitioners". It is perhaps because of this attitude that the Committee has recommended "methods that are un-usual," "novel and unorthodox" for "a country like ours." While admitting that "mankind has a right to all that is best in the sciences of health and healing," it does not seem to subscribe to the doctrine that no sick person may be denied, on financial grounds, the medical aid appropriate to his condition.

The Committee seems to have been more concerned with reconciling "the present hostile attitude of the exponents of the Indian and the supercilious attitude of the exponents of the Western system" than with facing the problem on scientific lines. Regard for the ancient and the public criticism have apparently weighed too heavily with it. It is more of a political than a scientific report.

If as said by Shri C. Rajagopalachari, "the so-called different schools are only progressive stages of the same science of healing pursued on the same lines of investigation and experiment" it stands to reason that the modern medical science is the most progressive and the most highly developed stage and ought, therefore, to be accepted as the most scientific and useful system of medicine. It will continue to take up whatever scientific truth is discovered by research in the other systems.

There is much else in the report which vitally concerns the modern medical science. Its votaries have got to study it very thoroughly and get ready to fight against the un-scientific recommendations made therein before it gets too late. In this note I have touched briefly on one or two points only in the hope that others, individually and collectively, will deal with the rest more thoroughly and expeditiously. It is the beginning of the campaign which, I trust, will gather strength by the active support of those who agree with me.

SOME MEDICAL INSTITUTIONS IN THE UNITED STATES OF AMERICA

G. V. S. MURTHI, M.D.,

(Civil Surgeon, Madras Medical Service. On deputation).

1. Army Institute of Pathology

Army Institute of Pathology, 7th and Independence Avenue, Washington D.C., is one of the biggest institutions in the United States of America. One is not aware if there is an institution of its dimensions elsewhere in the world. It is located in a group of buildings which are in close vicinity to one another and is contemplating to expand to ten times its present size on account of its increasing utility.

It is under the administrative control of a Director, of the rank of a Brigadier General of the United States Army and despite its name it has on its staff both civil and military personnel. It derives material from all U.S. military hospitals stationed at home as well as overseas. It also takes the material from all the civil hospitals and teaching institutions as well.

It consists of four departments:—1. Registry of pathology, 2. Department of pathology, 3. Army Medical Museum and 4. Army Medical Illustrative Service. Each of these fulfils a function of immense importance in the record, investigation, publicity and teaching of medical knowledge. A review of their working is described below.

Director:

(*i*) *Registry of Pathology*—Reception, allocation, modification and record.

(*ii*) *Department of Pathology*—Specialist investigation, academic research and issue of up-to-date liteture based on study.

(*iii*) *Army Medical Museum*—Study in the preservation of museum specimens—Plastics. Pool for specimens and slides for museums in U.S.A. Museum for students and practitioners. Museum of instruments and appliances. Museum for the public.

(*iv*) *Army Medical Illustrative Centre*—Preparation of films for teaching and propaganda—and pool. Preparation of projection slides for teaching and propaganda—pool. Photography, microphotography, painting, clour printing, embossing etc.,—and pool.

Preparation of placards, posters etc., for public health exhibitions in colloboration with the Public Health Department.

1. *Registry of Pathology*—This department receives all the postmortem specimens, case records and all other information from various institutions and after duly registering the same forwards it to the appropriate branch in the department of pathology for reinvestigation and study. It further records the information available after such study under the appropriate head of Nomenclature accepted by the National Research Council. The advantage that a registry of this nature offers is something immense for statistical, academic and research purposes—which is quite a contrast to what is available from the Registrar General's figures or Death Registers in other countries including our own.

2. *Department of Pathology*—This is the most academic part of the Institute and has on its staff some of the most eminent and experienced pathologists, some of whom indeed have made a life time study of a particular branch of the subject such as neuropathology or ophthalmic pathology. These various branches have their own chiefs, assistants, research fellows and associates, who work on the material that comes to their department. The results of such an elaborate study go down into the Registry. From this wealth of material slides on various topics of a routine as well as of obscure nature are made available with descriptive literature and can be borrowed by post graduates and institutions. The specimens are passed on to the Museum.

The various branches in this department work with a central pool of technicians. They never serve as a primary diagnostic centre.

3. *Army Medical Museum*—The duties that this department is fulfilling and the ideals that it has set for itself is something amazing. It has accumulated material of a varied kind from old microscopes to old plaster models, some of which date back to centuries. While carrying out an investigation in the newer methods of preserving pathological specimens—now in plastic casings—it organises popular museums and exhibitions to the public, pathology museum for students and practitioners and a historical museum of instruments and appliances. With the abundance of material that comes into its hands it serves as a pool of pathological slides and specimens that can be drawn by museums and teaching institutions all over America.

4. *Army Medical Illustrative Service*—This contains a variety of highly specialised technicians ranging from film shooters, microphotographers and artists to printers and engravers. It executes the most varied work from public health posters in wood to colour printing. I was impressed with the new method of colour printing of diagrams of viscera that gives a three dimensional effect. All modern visual and auditory methods are availed to device means to spread the knowledge of disease for popular information as well as academical teaching.

Conclusion—One has little doubts of the value of an institution of this nature in the collection and academic investigation of data pertaining to disease. It serves as a base for post graduates and research workers; and as a refresher centre for military and civil practitioners. Above all it has an overall value in the furtherance of public propaganda and academic

teaching. It is possible that the early establishment of a similar institution in our own country is under contemplation. Meanwhile I wish to draw attention to the fact that scholars and deputationists that may find it possible to visit this country can derive immense benefit by availing the facilities of this long standing institution with the co-operation and goodwill of U.S. authorities, who have been always kind to us. It is specially useful for the following categories of scholars:

(*a*) Pathologists or teachers in pathology, who have or who intend to make pathology their life career;

(*b*) Curators of pathology and public health museums;

(*c*) Public Health Officers interested in public health propaganda; and

(*d*) Selected high grade technicians.

2. The National Institute of Health

The National Institute of Health, the principal research arm of the United States Public Health Service has laboratories and field stations which are now counted among the finest and largest in the world. To us in India, where we are striving to establish our own national institutions, it serves as an object lesson of phenomenal growth of institutions that can occur in self-governing countries when they serve national interests.

In 1897, when bacteriology was a new science, a laboratory with apparatus modelled after that used by Koch, was fitted up in a small room at the Marine Hospital on Staten Island. Four years later this was shifted to better quarters in Washington and was officially known as Hygienic Laboratories. This was principally used for the training of officers in the bacteriological diagnosis of diseases and scientific investigation of causation and prevention of contagious diseases. Before long the Laboratories were dealing with all problems encountered in the Public Health Service and its studies included laboratory research and field investigations of all diseases that affect the health of the nation. By 1930 the one time single room laboratory grew into four big buildings and came to be known as the National Institute of Health. In 1935 a tract of land of 90 acres was donated by a philanthropist and now houses the extensive laboratories of the Institute at Bethesda, which is about 10 miles from of land of 90 acres was donated by a philonthrophist Washington.

During the 50 years of its existence, scientists of outstanding ability like Rosenau, Anderson, Goldberger, Armstrong, and Evans carried out work in important fields of medical research extending their investigations to other parts of the globe. Early studies of these pioneer workers relate to subjects like sensitisation diseases, typhoid and typhus fevers, brucellosis, tularaemia, epidemic encephalitis and lymphocytic choriomeningitis.

The Institute is now staffed with 150 commissioned officers, 750 professional and scientific personnel, 75 trainees and fellows and some 450 others, who provide essential, administrative, scientific and other maintenance services in support of the research. It is now planned to construct in the near future a clinical centre providing 500 clinical beds and associate laboratories.

Work is carried out in the various divisions of the institute as below:—

1. *The Cancer Institute*—This will be described in more detail later as an example. Illustrative studies in this section pertain to tissue cultures, Rous sarcoma virus, vitamines and proteins in relation to cancer, propagation of inbred mouse strains in relation to the genetic factors in the causation of cancer, chemotherapy of tumours, experimental production of tumours and so on.

2. *Division of Physiology and Biochemistry*—This is made up of sections on Cardiovascular Diseases, Dental Research, Nutrition etc. Illustrative studies in this section pertain to coronary artery disease, morphine substitutes, enzyme studies, effect of fluorine on dental decay and vitamines and blood dyscrasias.

3. *Division of Infectious Diseases*—This division centres its research chiefly in the epidemiology, diagnosis, cause, prevention and treatment of communicable diseases. Illustrative studies relate to Q fever, poliomyelitis, influenza, common cold, rheumatic heart disease, brucellosis, psittacosis and tuberculosis.

4. *Division of Tropical diseases*—This division is well established on a comprehensive basis under sections devoted to certain specific outstanding problems in Tropical Medicine such as Prevention of Malaria, Chemotherapy of Malaria, Helminthic Diseases and so on; and is further augmented by field stations in suitable places.

5. *Biologics Control Laboratory*—This is designated to perform the functions of control of biologic products. Research on the problems related to the preservation of the potency of biologic products is one of its duties. Illustrative studies include blood grouping and Rh typing sera, rabies vaccine, dysenteriae toxoid etc.

6. *Laboratory of Physical Biology*—This concentrates on basic research in the fields of biological chemistry and physics, including high and low energy radiation biology, molecular biophysical studies and cellular metabolism.

7. *Division of Research Grants and Fellowships*—To this division are detailed the administrative functions such as processing of papers, paying grants and keeping pertinent records and the analysis of reports in connection with various funds allotted.

In the matter of granting funds to individual workers or institutions and in the selection of fellows, the division seeks the assistance of Study Sections, composed of consultants of outstanding merit who are acknowledged to be competent to evaluate the scientific ability of the applicant and suitability of the proposed research.

3. The National Cancer Institute

The National Cancer Institute, which is within the scheme of the National Institute of Health, was created in 1937 by an Act of the United States

Congress, which also authorised the formation of the National Advisory Council. Six members are selected from leading medical and scientific authorities in the study of cancer in U.S.A. serve a three year term on the Council, of which the Surgeon General of the Public Health is the chairman. This Advisory Council co-ordinates cancer research all over in America, reviews and makes recommendations on all applications for grants-in-aid and advises on the work at the Cancer Institute.

The work of the National Cancer Institute falls into three categories—Research on cancer; control of cancer and research grants.

The Laboratories—These are located in two buildings, one of five floors and the other of three floors and work under the administrative control of the Scientific Director. It was of interest to walk into these laboratories and find how well the floor space allotted to each worker is utilised, being filled with charts, records and apparatus that is manufactured and improvised with scarcely elbow room to move about.

The Research Workers—Not only medical men of eminence but very highly qualified men in the basic sciences of physics, chemistry and biology are working in these laboratories. There are problems which require the assistance or even the independent pursuit of a biologist, biochemist or a biophysicist. There was apparatus that has to be newly improvised or that can be handled only by a physicist conversant with radiation, electronics, atomic energy etc.

Some of the staff members are assigned to branch laboratories elsewhere as in Baltimore, Princeton, Washington or San Francisco and work in close colloboration with medical schools and teaching hospitals.

The Apparatus—Studies are being conducted with apparatus that is not ordinarily available in laboratories, and with apparatus that is newly improvised and will take long to be available elsewhere in the world. The polarograph is adapted for measurement of the oxygen consumption of tumours and for qualitative and quantitative analysis of compounds formed in tumour metabolism. By means of a multiple-recording assembly, the Eh and pH and oxygen consumption of tumour materials are measured simultaneously. There were the ultracentrifuge, the electron microscope and the mass spectrometer.

The Journal—The Journal of the National Cancer Institute, published every two months, records the work of the Institute for the benefit of other research organisations, scientists and physicians.

Cancer Control—To the Cancer Control Branch of the Institute is delegated the task of maintaining a program to reduce the number of cancer deaths by helping practising physicians and their patients to make the most effective use of current knowledge on cancer. Grants are made for training doctors in diagnosis and treatment of cancer. Loans of Government-owned radium are made to hospitals for the treatment of cancer patients. To supplement educational phases of control, money is granted to official health agencies to amplify their own cancer control programs. Literature and graphic illustrations of the most recent findings on cancer for education of the public are issued by the Institute in collaboration with other agencies and foundations dedicated to the elimination of this disease.

Recommendations

On visiting these institutions certain salient facts have impressed me, as indeed they must have impressed others as well, and I venture to make the following recommendations:

(1) It will lead to a great deal of understanding in the interests of the early establishment of national scientific institutions if our politician-administrators visit some of these institutions to appreciate the enormity of equipment which modern research requires; and also to realise the extent of financial commitment involved in research, which must be deemed as a project that certainly gives no immediate return, and perhaps not even ultimate return in certain phases of its activity.

(2) No satisfactory research can be carried out unless it is sponsored financially sufficient to procure modern implements and appliances and on occasions to improvise new ones; and also to satisfy the material needs of the worker in pay and emoluments so as to attract the finest intellects of the country and retain them in research as a career. Economic research ventures are wasteful.

(3) Young men who are anxious to make research their life career will do well to realise that a research worker is the most highly limited environmental animal and research conducted in foreign institutions cannot be sustained if the environmental facilities of the worker cannot be re-established on his return to the home country, as research to be tangible must extend into an entire life time.

(4) Our medical men and scientists must show the initiative and interest for original and independent work and thought irrespective of their environmental limitations and unmindful of results, for such a spirit alone will provide the tradition and the background that are so essential for the growth of national institutions. Sporadic and implanted attempts at research are utterly without value to the nation.

4. The National Naval Medical Centre

The National Naval Medical Centre, Washington D.C., located on a 248 acres site at Bethesda in the close vicinity of the National Institute of Health is one of the biggest hospitals in the United States with a peace time bed complement of 1300 beds to serve the sick of the families and personnel of the U.S. Navy. Peace time medical military institutions in India during the bygone regime were admittedly neither attractive nor efficient, but here in America one finds that both the army and navy medical institutions, some of which are long standing, are not only attractive and efficient but have facilities for high grade research work and have on their staff some of the most eminent men in the various specialities of medicine. Institutions

of this nature are therefore of immense interest to us when we are also trying to grapple the numerous problems that are arising with the enlistment of our nationals in the defence forces, the army, the navy and the air force of the country in our new political status.

The Naval Medical Centre was established by the Navy Department in 1935 to function as a medical, diagnostic and educational centre. During 1939-41, the buildings in which the centre is now located were built at a cost of five million dollars equivalent to two crores of rupees. The tower of the administration building, which has 13 floors is 270 feet in height and dominates the landscape for many miles in all directions. It is devoted to offices, laboratories, lecture halls, wards and sick rooms. The operating suite is on the second floor and the main operating room, which is lined with pink Tennessee marble, has two glass-inclosed viewing galleries equipped with sound apparatus for amplified transmission of the operator's voice as an aid in teaching. There is an auditorium with a seating capacity of 600. The exigencies of war has necessitated the building of one-storey temporary wards connected to the permanent building.

The Medical Officer in Command of the Naval Medical Centre, who is of the rank of a Rear Admiral, is in general administrative charge of the various entities of the centre, which are as follows:

(1) *The Naval Hospital*—This is a general hospital for the diagnosis, treatment and hospitalisation of active and retired personnel of the Navy and Marine Corps and their dependents, and special groups of individuals, such as members of Congress, members of the foreign service of the Department of State, and naval attaches of foreign countries. The hospital is fully equipped with all modern facilities and has been specially designated as a centre for neurosurgery, plastic surgery and oncology. The hospital carries on an active and vigorous residency and intern training program for its officers, who are periodically seconded for training or duty. It may co-opt on its staff some eminent consultants in certain specialities on a part time basis if necessary. It is also a centre for the training of the medical personnel.

(2) *The Naval Medical School*—This is fundamentally a post-graduate institution. Its chief mission in peace time is the training of medical officers and corpsmen of the navy for service ashore and afloat. During the recent war it assumed the function of training its officers and personnel in various specialities of timely importance incident to the war and to its geographical theatres of operation, a factor which must have considerably influenced the efficiency of the service under the exigencies of the war.

The basic training course for officers extends over a period of six months; and besides there are courses in epidemiology, pathology, radiology and others. There are also technicians courses for hospital corpsmen in pharmacy, laboratory technique etc. The laboratories of the school serve the hospital as well as suburban naval hospitals and dispensaries. There is a large central library.

(3) *The Naval Dental School*—The school functions primarily for post-graduate instruction to naval dental officers and has a variety of courses on dental technology and oral surgery. On the day of my visit the school was having one of its usual monthly clinical meetings; the excellence of the exhibits that were on display fully justified the large number of dental practitioners, the majority of whom were civilian, that attended the session.

(4) *Naval Medical Research Institute*—This was inaugurated in 1942 and organised under the direction of a naval medical officer and a civilian Professor of Physiology of the North-western University. During the war time it has expanded enormously and has today on its staff 70 scientists in various biological sciences and approximately twice that number of technical assistants from the hospital corps and civil service. About one third of the scientific staff is civilian, one third are members of the allied science section of the medical service corps, and the remainder are medical and dental officers with aptitude for investigative endeavour. There are more than 100 laboratories designed for research in chemistry, bio-physics, physiology, psychology and so on; and besides, there are installations including pressure tanks for research in aviation, submarine and diving medicine. Applied research and the adaptation of research findings to procedures leading to the betterment of efficiency and health of naval personnel form an integral part of the research program.

(5) *Naval School of Hospital Administration*—The initial function of the school is to provide a concentrated course of instruction for medical service and hospital corps of officers in the various fields of hospital administration.

Conclusion

(1) The peace time military hospitals of the past regime in India do not offer us any background comparable with these American institutions. We will do well to study institutions of this nature before we organise institutions of our own for our growing Defence Services under the new regime in our country.

(2) The U.S. Army, Navy and Air Force has each a training and research centre of its own, a fact which is now being realized as unnecessary and wasteful. We may therefore organise one centre for all arms of service concentrating all facilities for research and teaching while having many hospitals spread over the country as they do have here under the Veterans Administration.

(3) For a medical man in India, to have chosen military career during the previous regime meant foregoing of all professional facility as the military hospitals offered no scope whatsoever for academic or research activity. If we are to set right this defect and attract intelligent medical men for careers in our country's Defence Services, we should model our institutions on lines similar to the set up of these American Institutions, which have established a record for high academic excellence and achieved outstanding and even classic results in the field of medical research.

JOURNAL OF THE

INDIAN MEDICAL ASSOCIATION

CALCUTTA, AUGUST, 1949

B. C. G. VACCINATION

It is more than a year that the Government of India started B.C.G. vaccination in India under the guidance of experts from Denmark and Norway and with the help of the World Health Organisation. B.C.G. vaccine has roused considerable interest in the world medical and public health literature, particularly after the last world war. While a large number of experts in the field of tuberculosis and epidemiology are enthusiastic about its success, there are not a few who are equally sceptical about the results so far claimed.

The need for finding some method of immunisation against tuberculosis has long been recognised. Attempts at vaccination with heat-killed tubercle bacilli have failed. In 1908, Clamette and Guerin isolated a strain of bovine tubercle bacillus, which they succeeded in rendering non-pathogenic to susceptible animals by successive cultures in bile-potato medium. This strain of tubercle bacillus, although non-pathogenic, was, however, found to render a tuberculosis-negative animal sensitive to tuberculin and resistant to subsequent virulent infection. After experiments on animals the B.C.G. was used as a vaccine in human beings and has been in use since 1921. Originally it was used orally, but as this method of administration was not followed by development of tuberculin sensitiveness in many cases, the subcutaneous route was subsequently adopted. It was soon replaced by the intracutaneous method and later by scarification or multiple puncture methods to reduce the number of unpleasant local abscesses which followed the subcutaneous injections. By these latter methods of administration, local abscesses or ulcerations have been reduced to negligible proportions and a very high rate of tuberculin conversions have been obtained.

As to the efficacy of the vaccine, a large number of studies have been published. Of these the most notable are those of Heimback in Oslo, Wallgren in Sweden, Ferguson in Canada, Aronson and Palmer in North America. Although none of these studies have been able to satisfy all the critics, they have definitely shown some advantage in favour of the vaccinated persons as compared with the non-vaccinated in the matter of morbidity and mortality from tuberculosis. It is generally agreed that by B.C.G. vaccination mortality from all forms of tuberculosis can be reduced by 4/5ths.

The main objections raised against the use of B.C.G. vaccine are two, namely, (1) it being a live vaccine it is possible for the bacilli to regain their original virulence and thus cause progressive disease in the vaccinated and (2) the need for prevaccinal and postvaccinal isolation of those who live in contact with open cases of tuberculosis.

As regards the first objection, it can be said that though the vaccine has been used on millions of human beings, no evidence of virulence in the B.C.G. strain has yet been observed. K. A. Jensen of Copenhagen State Serum Institute, has been able to maintain a strain of B.C.G. at more or less constant level of avirulence over a long period by cultivating on synthetic media under controlled conditions. The virulence is also accurately assessed regularly on guineapigs. The claim of Petroff that the B.C.G. strain could be made virulent has not been substantiated by others. The notorious disaster of Lubeck in 1930, which followed the use of B.C.G. vaccine has been proved to be due to a contamination of the vaccine with a virulent strain of human tubercle bacilli. So although B.C.G. strain can be taken to be reasonably safe, there is however need for constant vigilance at every step in the preparation of the vaccine and the need for a centralised source of production in a laboratory set apart exclusively for this work.

As for the other objection, many authorities have mentioned the need for a 6 weeks isolation previous to vaccination of all those who have been recently exposed to infection, to see whether they have already been infected. Similarly, after vaccination and before the tuberculin sensitiveness develops the need for protecting the vaccinated person from exposure to infection has also been emphasised by some. It is however, said that these periods of isolation before or after vaccination are advocated only to protect the reputation of the vaccine and not consequent on any increased susceptibility of the person during the preallergic period of a natural infection or of vaccination. The W.H.O. Sub-Committee on B.C.G. vaccination, therefore, has recommended that for mass vaccination programme, isolation of vaccinated persons if not possible, may be dispensed with.

In adopting B.C.G. on a mass scale in the anti-tuberculosis campaign in our country, one point must be kept in mind. B.C.G. vaccine causes an increased resistance to tuberculous infection by a biological process, and the degree of this resistance and its persistence depend on the general well-being and normal physiological conditions of the body. Conditions which may lower the general health and impair the physiological function of the body, such as undernourishment, tropical infections, unhygienic living, overwork, etc., are so prevalent and widespread that the object of the B.C.G. vaccination is likely to be defeated unless attention is also paid to other health measures on a mass scale. Furthermore, as the World Health Organisation has opined, *nowhere should B.C.G. programme replace the national effort to eradicate tuberculosis.*

It is thus imperative that B.C.G. vaccination should form only a part and a small one of the anti-tuberculosis measures adopted by the Government of India. The recent mass tuberculin testing done by the foreign experts have shown that in rural areas the majority people reach adulthood without tuberculisation. On the other hand, our own experience shows that primary tuberculosis in India most often runs into an acute progressive one, hence the chief sphere of mass vaccination lies in the rural areas of India and not in the cities which have been chosen by the Government of India.

CURRENT TOPICS

THE WORLD HEALTH ORGANISATION

The following are excerpts from the address by Dr. T. C. Routley, the General Secretary, Canadian Medical Association, delivered at the Annual Meeting of the Canadian Medical Association on 20th October, 1948:—

To Brazil and China must be given the credit for having suggested at the United Nations Conference in San Francisco, in June, 1945, the establishment within the framework of the United Nations of an international body concerned with the advancement and protection of the health of the people. Upon acceptance of the proposal, a small preparatory committee, on which Canada was represented by Dr. Brock Chisholm, Deputy Minister of National Health, met in Paris in February, 1946, to examine the proposal, with the result that 62 nations sent 260 delegates and observers to New York in June, 1946, where for more than five weeks they sat together moulding and hammering out the Constitution and By-laws of the World Health Organization.

On points of procedure, there were many shades of opinion. In the construction of legal phraseology, there was plenty of argument, but on the main issue of considering the health of all the people of the world, there was unanimity clothed with enthusiastic acceptance of the principle that to every man, woman and child should be given an opportunity to gain and enjoy maximum health. One did not observe any tendencies in the conference to split over ideologies, political considerations, national preferments or territorial gains. On the contrary, there was brought into focus an ideal, an objective, a declaration of good will, which stood out in a troubled world like a beacon light. Yes, the torch was lighted and lifted high but much remains to be accomplished before its radiant light shines throughout the world. Whether or not that light goes out depends upon many factors which lie beyond the influence and control of the medical profession; but our opportunities and responsibilities surely are clear in our own field. We must do all in our power not only to keep this torch of hopefulness alight but to carry it around the globe in order that mankind may see in this dark and confused world at least one good reason and hope for living together in peace and amity. Service which aims to provide health and healing to all mankind may prove to be the atomic bomb of peace.

Following the New York conference, an interim Commission of 18 persons representing 18 nations, was appointed to proceed with the building the structure of the World Health Organization and to put it in motion. Upwards of 50 nations expressed their adherence to the organization, thus guaranteeing its position as an integral part of the United Nations machinery. The Commission met five times, once in New York and four times in Geneva. It is a great satisfaction to be able to report that, although the members came from different lands, spoke different tongues and stemmed from different cultures, nothing but harmony and goodwill prevailed at every meeting. The reason for this harmony is not far to see. We were motivated by one objective. We had a task to perform which was challenging and peculiarly unifying, and herein lies the secret of co-operation.

By May, 1948, twenty-six nations had ratified the Constitution (the minimum number required to officially constitute the World Health Organization) and the Interim Commission summoned the General Assembly of the World Health Organization to meet in Geneva on June 24th. 285 delegates and observers from 54 nations, 9 international organizations and 5 military zones of occupation answered the roll call. For a period of one month, working in plenary session and a number of committees, the delegates completed the initial building of the World Health Organization and accepted it as an organization clothed with the necessary powers and authority, and fully competent to embark upon its non-political, humane task of assisting all mankind to attain the highest possible level of health.

A Board of Directors of eighteen persons was appointed to manage the affairs of the organization, with Dr. Brock Chisholm, being elected Director General for a period of five years. Geneva was selected as the permanent site for the head office and arrangements were worked out to establish between five and seven regional offices, strategically placed, around the world. A budget of $5,000,000 was established for the coming year. Among the projects which were given priority are found the following, showing the amount of money allotted to each one:

	$
Malaria	235,000
Tuberculosis	270,000
Maternal and Child Health ..	167,000
Venereal Diseases	156,000
Fellowships for Post Graduate Study	1,000,000
Publications, Information & Library Service	450,000

With respect to the foregoing projects as well as a number of others, it should be underlined that the World Health Organization proposes to act upon receiving invitations and the necessary authority from responsible governments in whose territories the help of the World Health Organization is desired. It can not be too strongly emphasized that the World Health Organization is not a superstructure or agency which can in any way interfere with the autonomy of any nation. However, there is already abundant evidence available that the World Health Organization will be invited into many lands—indeed, has already been so invited—to undertake beneficent services in the health field either alone or in co-operation with local authorities.

The foundations of the World Health Organization appear to have been well and truly laid. The superstructure will of necessity grow slowly and manifest its ability to render service as opportunity presents. The organization has a programme and a challenge to fight disease on all fronts, and, in so doing, to help to raise the standards of health throughout the world.

There can be no question but that this institution, founded upon the concept of service to all mankind, can be a catalytic agent of universal value.

Concomitantly with the development of the World Health Organization, another equally important international health body was in process of formation. I refer to the World Medical Association.

In the autumn of 1946, on the invitation of the British Medical Association upwards of 100 delegates and observers from 32 national medical associations met in London to consider the advisability of organizing an international medical association.

Early in the discussions, the question was asked—a question which probably has already occurred to you—why another international medical body? The answer emerged unmistakably clearly. The doctors of the world, represented by their national medical association, have a common denominator, and have so many problems in common that it appeared logical for them to form themselves into a world body. Furthermore, it was held that, if the World Health Organization is to succeed, it requires the whole-hearted cooperation of the doctors of the world just as surely as an electric transmission line requires electric power flowing through it in order that it may render service. After several days of discussion, it was unanimously agreed that the World Medical Association should be formed with the following objects:—

1. To promote closer ties among the national medical organizations and among the doctors of the world by personal contact and all other means available.

2. To maintain the honour and protect the interests of the medical profession.

3. To study and report on the professional problems which confront the medical profession in the different countries.

4. To organize an exchange of information on matters of interest to the medical profession.

5. To establish relations with, and to present the views of the medical profession to, the World Health Organization, U.N.E.S.C.O., and other appropriate bodies.

6. To assist all peoples of the world to attain the highest possible level of health.

7. To promote world peace.

Time does not permit us to examine closely and in detail all of these objects but I am confident that each of you will recognize in them sound reasons for their acceptance by all medical practitioners who adhere to the principles which have made our calling so great and so noble. There will be recognized, too, similarity in the objectives of the World Health Organization, especially the object which reads, "To assist all peoples of the world to attain the highest possible level of health."

Before the conference adjourned, an Organizing Committee of ten persons was appointed to prepare the Constitution and By-laws and outline the mechanism by which the World Medical Association might function. The Committee met four times during the following year, twice in London and twice in Paris. The first annual meeting was held in Paris in September, 1947, this beautiful city having been chosen primarily because it was the home of the Old Association Professionnelle Internationale des Medecins (A.P.I.M.) which was the prologue of the World Medical Association in the years before the war, and enjoyed the support of a number of European nations. To this first annual meeting, 45 national medical associations sent 125 delegates and observers whose main task was to receive the report of the Organizing Committee and complete the writing of the Constitution and By-laws which the committee had prepared.

The second annual meeting was held in Geneva in September, 1948.

Now, with two annual meetings behind it, the World Medical Association has emerged from the embryonic stage showing every promise of becoming a vitally efficient and useful organization.

The head office has been established in New York City in the beautiful building of the Academy of Medicine of New York, with Dr. Louis H. Bauer in charge as Secretary General. An American Supporting Committee, stemming largely from the American Medical Association and a group of interested business friends, has guaranteed to underwrite the cost of maintaining and operating the central office up to $50,000 a year for five years. Already, the Committee feels that this sum may be inadequate and has raised its objective to between $75,000 and $100,000 a year.

The Constitution provides for an administrative council of ten elected persons with the President, President-Elect and Honorary Treasurer being members ex-officio.

Believing that you might be interested in knowing who the members of Council are and from whence they come, the list is appended hereunder:—

Dr. E. Marquis, France (President); Dr. Charles Hill, England (President-elect); Dr. O. Leuch, Switzerland (Honorary-Treasurer); Dr. Jose A. Bustamante, Cuba; Dr. P. Cibrie, France; Dr. Pierre Glorieux, Belgium; Dr. Elmer Henderson, United States of America; Dr. J. A. Pridham, Great Britain; Dr. S. C. Sen, India; Dr. L. G. Tornel, Spain; Dr. John Yui, China; Dr. D. Knutson, Sweden (Vice-Chairman; Dr. T. C. Routley, Canada (Chairman) and Dr. Louis H. Bauer, New York, (Secretary-General).

The Association has placed its annual meetings for the next three years as follows:—

1949—London, England.

1950—The United States of America (the place to be named by the American Medical Association).

1951—Stockholm, Sweden.

Now, may we turn for a few moments to an examination of some of the activities of the Association. Several surveys have already begun which will bring to light much information which, heretofore, has been unknown because it has never before been

gathered together. From the results already available, it is abundantly clear that much of this information will be of value to our own Association and others.

It may come as a surprise to some to learn that the old oath of Hippocrates, so well known to us in Canada is indeed not well-known nor has it been accepted in many parts of the world. It was considered wise, therefore, at the last annual meeting to devise and adopt a new pledge incorporating the principles of behaviour and ethics upon which the traditions and esprit de corps of medicine rests. It is very significant to be able to report that this document was accepted by representatives of all the nations who were present, and it was proposed that it be made available in the appropriate languages to all the doctors of the world. Furthermore, it is believed that its acceptance by the oncoming generations of doctors in every land will do much to raise the standard of medicine throughout the world. The following is the pledge with which the name of Geneva is to be associated:

At the time of being admitted as a member of the Medical Profession:

(1) I solemnly pledge myself to consecrate my life to the service of humanity.

(2) I will give to my teachers the respect and gratitude which is their due.

(3) I will practise my profession with conscience and dignity.

(4) The health of my patient will be my first consideration.

(5) I will respect the secrets which are confided in me.

(6) I will maintain by all the means in my power, the honour and the noble traditions of the medical profession.

(7) My colleagues will be my brothers.

(8) I will not permit considerations of religion, nationality, race, party politics or social standing to intervene between my duty and my patient.

(9) I will maintain the utmost respect for human life, from the time of conception; even under threat, I will not use my medical knowledge contrary to the laws of humanity.

(10) I make these promises solemnly, freely and upon my honour.

Considerable time was spent by the General Assembly in discussing the principles of social security, especially those guide-posts around which the medical profession should rally in the interests of both the public and the profession. With this end in view, a declaration of the principles of social security, as affecting the medical profession was adopted and is appended hereunder.

(1) Freedom of choice of physician by the patient.

(2) Freedom of choice of hospital by the patient.

(3) No intervention of third party between physician and patient.

(4) Freedom of physician to choose his location and type of practice.

(5) No restriction of medication or mode of treatment by physician, except in case of abuse.

(6) All medical services to be controlled by physician.

(7) Appropriate representation of the medical profession in every official body dealing with medical care in Social Security.

(8) That it is not in the public interest that doctors should be full-time salaried servants of Government or social security bodies.

(9) Remuneration of medical services ought not to depend directly on the financial condition of the insurance organization.

(10) Any social security or insurance plan must be open to the participation of any licensed physician, and no physician should be compelled to participate if he does not wish to do so.

(11) Freedom of choice of patient by doctor except in cases of emergency or humanitarian considerations.

(12) It is desirable that compulsory insurance be limited to those who cannot pay for their own services.

(13) There should be no exploitation of the profession by anyone.

Medical war crimes, especially as they were brought to light in post-war Germany, was a subject which engaged the close attention of the Assembly; and the German Medical Association now forming in the Western part of the country, has been requested to repudiate the crimes and medical criminals and give a guarantee against future acts of such barbarity before being accepted as a member of the World Medical Association. If war should ever come again—which we all trust and pray will not happen—it may be that the action of the World Medical Association in this field will act as a brake upon medical war crimes.

Other subjects engaging the attention of the General Assembly were Patent Medicines, Purification of Drugs, Medical Qualification, Medical Education (under-graduate and post-graduate), Cancer Control, Co-operation with other bodies, Scientific Research, and the ultimate disposition of medical refugees. A number of these problems are being studied by carefully selected committees.

The Assembly decided that the Association should, at regular intervals, issue a bulletin, and, for this purpose, an Editorial Board was appointed consisting

of Dr. Morris Fishbein, Editor of the American Medical Association Journal (Chairman); Dr. Hugh Clegg, Editor of the British Medical Journal; Dr. John Yui, Secretary of the China Medical Association, and Dr. H.E.MacDermot, Editor of the Canadian Medical Association Journal, with power to add. This Bulletin will not be a scientific Journal but rather will be used to acquaint the profession throughout the world with medical problems which normally come before national medical associations. One issue has already been prepared and it is confidently believed that the Bulletin will prove to be an extremely useful medium.

The World Health Organization and the World Medical Association were conceived in the hearts and minds of men and women who believe in the golden rule and place Service before Self, persons whose ambitions were completely unselfish in their expressed desires to do all in their power to provide healing and comfort to mankind everywhere—*Manitoba Med. Rev.*, **28**:667, 1948.

THE WORLD MEDICAL ASSOCIATION

W.M.A. Bulletin—Report of Editorial Committee

Function and General Character—The functions of the Bulletin are to be the official organ of the W.M.A., to assist in carrying out the Association's defined objects, and to be a means of contact and communication between the different national medical associations.

It should be mainly factual in character, its primary purposes being to record the proceedings of the General Assembly, to provide general information about the work of the Association, and to disseminate news of general interest from Member-associations. Scientific articles and news of advances in clinical medicine should be avoided.

Contents—The contents would comprise the following material:—

Record of work of W.M.A., *e.g.*, proceedings of General Assembly.

Council and Committee work.

Official announcements.

Special investigations.

Co-ordination of activities of Member-associations.

Editorial matter, *e.g.* leading articles, annotations.

News from Member-associations.

Articles on subjects within the range of the W.M.A.'s activities.

Information regarding kindred bodies.

Circulation—A. There should be issued copies of the Bulletin free to all Member-associations their officers and the members of their governing bodies.

(*a*) To all members of General Assembly and Council, not otherwise covered.

(*b*) To editors of leading medical journals.

(*c*) To official bodies interested in related activities, including the American Committee.

In the case of libraries, they would obtain the Bulletin by subscription, except where they were unable on financial grounds to subscribe.

B. There should be offered for sale by subscription copies of the Bulletin to individuals.

Frequency—The Bulletin should appear quarterly, including one issue after the General Assembly and one after the Spring meeting of the Council.

Direction—There should be an Editor appointed by the Council, aided by an Editorial Board including at the outset the Secretary-General and the Assistant Secretaries.

Special Reports—The special reports prepared by the W.M.A. will not normally be published in full in the Bulletin but referred to in Editorial material and summarized in a condensed form. The aim of the editor will be to draw attention to such special reports.

Languages—All three official languages should be used. In the case of articles or contributions from a Member-association, they should appear in their original language with a summary in the other two official languages. In the case of official announcements, official reports to leading articles, they should appear in all three languages.

Finance—The Editor should be part-time honorary for the first year, the position to be reconsidered at the end of that year. He will submit to the Secretary-General for the approval of the Council each year a budget covering the cost of production and a stated amount to be available, at the discretion of the Editor, for the payment of commissioned articles, etc.

Advertisements—Advertisments should be sought for the Bulletin. The Editor should be responsible for the control of the advertisement columns. Advertisements not acceptable to the national medical associations of the country from which the product comes should be rejected. Advertisements which do not conform to the highest standards of the leading medical journals of the world should be rejected. The Editor should report all rejections of advertisements to the Editorial Board which may confirm his action or otherwise.

Other points—(1) The Editor will attend meetings of the General Assembly and the Council.

(2) The Editor should have experience of the kind of problem which confronts the Council and of medical journalism.

Adopted—Center of Publication: United States of America.

Editor: Doctor Morris Fishbein.

Editorial Board: Assistant Secretaries with additions by Dr. Fishbein.

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Preliminary Report on Social Security

Amendment to Document C.9/48 as Adopted by General Assembly September, 1948

Social security is in the process of development throughout the world. It has reached a much more advanced stage in Europe than it has in the Americas.

In Europe, however, there are different levels. Even Wilbur J. Cohen, who is an ardent advocate of complete social security coverage in the United States, said as recently as September 1947, "No comprehensive statistical series have been developed which would permit useful and up-to-date comparisons to be made of the relative status and progress of social security programs of the different countries." Such being the case comparisons are difficult to make. The International Labor Organization has published figures on some aspects of social security but relative values are not available.

The International Social Security Association and the International Labor Organization both seem determined to foster a complete social security programme, including complete medical care throughout the world.

The report prepared by Doctor Mouthon (N. A. 3/48) shows that there is planned the provision of medical care under social security schemes which would ultimately cover all members of the community including all phases of medical care. The report further, calls attention to the lack of agreement between the medical profession and the insurance societies.

There would appear little doubt, after a study of the various documents available, that the ultimate aim of most of the ardent social security advocates and social security organizations is full-time salaried service on the part of physicians. They also desire that the benefits of social security plans should be interchangeable between the different countries; and that all plans be compulsory in nature.

There are many phases of social security which do not primarily concern the medical profession or which are universally accepted by it. For example, old age security is more or less generally accepted. Workmen's compensation for accidents and occupational diseases is rather widespread. Unemployment insurance is developing slowly. Compulsory plans of the latter are working in Great Britain, Greece, Poland and some Swiss cantons. France has an unemployment assistance plan. Voluntary insurance exists in some countries. In the United States old age assistance has been in effect for about ten (10) years. About sixty million (60,000,000) people are covered by social security. Workmen's compensation insurance is available for federal employees and nearly all states have a compulsory law for employees above a certain number. The state laws vary considerably in their application and methods of operation. Unemployment insurance is being encouraged by the federal government. States have varying laws on the subject. All laws are similar in principle, but vary as to benefits, contributions and coverage.

The part of social security which has caused the most debate has been compulsory sickness insurance, which will be demanded when any social security plan is adopted. In considering the amount to be paid by any social insurance scheme, to an individual, the cost of providing that individual with medical care is a factor of importance and is difficult to calculate. From one point of view the whole cost must be covered by social security or by the insurance system. From the other point of view the patient has to know and be interested in the cost of the service which is rendered.

All European countries have some form of sickness insurance. The scope and type varies from a complete system of State Medicine, such as exists in Russia, through compulsory insurance plans covering a part of the population, to voluntary plans subsidized by the government as has existed in Sweden.

In France, the first social insurance act dates from 1928, although occupational risks have been covered since 1898. In 1945 unification and extension of legislation on social protection was provided. All employed persons and persons assimilated to employed persons are compulsorily insured for sickness, maternity, long-term sickness, invalidity, old age and death. Voluntary insurance is provided for certain others. Cash benefits are provided.

The Netherlands has both compulsory and voluntary insurance, but the former is increasing and the latter decreasing. The compulsory insurance covers all employed up to a certain salary level. Both cash and medical benefits are provided.

Sweden has had state subsidized voluntary unemployed insurance, which has been changed to compulsory. Compulsory sickness insurance has been subsidized for voluntary, and will come into effect in 1950. Medical benefits take the form of a refund of seventy-five per cent (75 per cent) of the doctor's fee (within limits). Hospital treatment is free for the entire population.

Switzerland has compulsory accident and old age and survivors insurance applied throughout the Confederation. Sickness, maternity and unemployment insurance vary in the different cantons, in some of which it is compulsory and in some voluntary.

In Belgium, compulsory sickness, invalidity and unemloyment insurance was introduced in 1945 to replace the former voluntary plans. The patient may have to pay for part of the cost.

In other continental countries variations of the above plans exist.

In Great Britain the limited compulsory sickness insurance plan has recently led to the new national health act in which all health services have been placed under the jurisdiction of the health ministry. The British Medical profession demanded certain changes,

some of which were granted. Perhaps the most important concession on the part of the government was that physicians could not be made full time salaried officials of the government, except by further legislation, and not by departmental regulation.

In the United States there has been a continuing battle, for over ten (10) years between certain governmental officials, labor officials and social security organizations on the one hand, and the vast majority of the medical profession on the other over the subject of compulsory sickness insurance. Up to the present, no law on the subject has been enacted. The battle is continuing, however.

The American Medical Association has gone on record as favouring, extension of facilities for preventive medicine, public health, extension of hospital and diagnostic facilities, maternal and child welfare, with government contributions where necessary, the administration to be on a local level and in the case of child and maternal welfare, the medical aid to be given through a physician of the patient's choice whereever possible. It has also fostered voluntary medical care and hospital insurance.

Luxembourg issued a brochure entitled "Le Corps Medical et L'Assurance Maladie" in April 1948. The profession there is struggling against propaganda defaming the medical profession and attempts on the part of officials to abolish free choice of physician. These two problems are met with, more or less, universally. It would seem that there is a group—non-medical—which in its campaign to establish state medicine throughout the world follows a definite pattern.

1. To discredit the medical profession with the public.

2. To abolish free choice of physician and hospital.

3. To bring about the regimenting of the medical profession under state control, eventually as full-time salaried servants of the government.

There is rarely any disposition on their part to consult with the medical profession on mutual problems. It is usually a case of a lay group trying to enforce its preconceived opinions on the profession and the public, without regard to the interests of either of them.

The council recommends that the General Assembly direct the following:—

1. That a questionnaire be sent out by the Secretary-General to all national medical associations, to determine the status of social security in each country.

2. That upon the receipt of the answers to this questionnaire, a survey be made by the Secretary-General's Office which will outline the status of social security in each country, and that this survey be distributed to all national medical associations.

3. That all national medical associations be requested to keep the Secretary-General informed of any proposed or actual changes in the social security laws in its country. The Secretary-General is, in turn, to keep all other national medical associations informed of these changes.

4. That a permanent Committee on Social Security be established by the General Assembly and appointed by Council.

5. That this Committee report annually to the General Assembly on the subject.

6. That the General Assembly direct the Council to send Observers to international meetings on social security whenever possible, and that the Observers report their findings to the Secretary-General for transmission to the above Committee and to the national medical associations.

7. That the General Assembly adopt the following:—

Whenever medical care is provided as part of social security the following principles should govern its provisions:

(*i*) Freedom of choice of physician by the patient. Liberty of physician to choose patient except in cases of urgency or humanitarianism.

(*ii*) No intervention of third party between physician and patient.

(*iii*) Where medical service is to be submitted to control, this control should be exercised by physicians.

(*iv*) Freedom of choice of hospital by patient.

(*v*) Freedom of the physician to choose the location and type of his practice.

(*vi*) No restriction of medication or mode of treatment by physician except in case of abuse.

(*vii*) Appropriate representation of medical profession in every official body dealing with medical care.

(*viii*) It is not in the public interest that physicians should be full-time salaried servants of the government or social security bodies.

(*ix*) Remuneration of medical services ought not to depend directly on the financial condition of the insurance organization.

(*x*) Any social security or insurance plan must be open to the participation of any licensed physician, and no physician should be compelled to participate if he does not wish to do so.

(*xi*) Compulsory health insurance plans should cover only those persons who are unable to make their own arrangements for medical care.

(*xii*) There shall be no exploitation of the physician, the physicians services or the public by any person or organization.

NOTES AND NEWS

FLORENCE NIGHTINGALE MEDALS FOR INDIA

The Florence Nightingale Committee of the International Red Cross have awarded two Florence Nightingale medals to India this year. One of the medals has been awarded to Mrs. D.G. Howrah, chief principal matron in the Medical Directorate in recognition of her outstanding services during the war, while the other has been awarded to Miss M. Thomas who is at present undergoing a postgraduate course in Public Health Nursing in the United Kingdom on a Red Cross scholarship. Miss Thomas distinguished herself by exceptional devotion to duty at the Kurukshetra refugee camp.

This medal was established by the Sixth International Red Cross conference at Washington in 1912. and is awarded to trained nurses who have won recognition for their meritorious services to the cause of nursing.

NATIONAL HEALTH INSURANCE IN THE U. S. A.

National health is increasingly becoming the concern of the advanced countries of the West who seek to make provision for medical protection to all their citizens "from the cradle to the grave". Mighty in resources, America's headway in material progress is still in many respects unsurpassed in magnitude and the Health Aid Bill recently introduced in both Houses of the Congress is another bid on her part to bring a revolution in the national health organisation of her people. The Bill aims to provide for a comprehensive and compulsory insurance scheme which will assure medical care to at least 85 per cent of the population. Under the scheme there will be a payroll levy of 3 per cent for the first $4,800 of incomes and the assessment is to be shared equally by the employer and the employee. The maximum contribution assessed will not exceed $72 a year.

The plan seeks to improve the quality of medical care as well as to ensure the availability of such care to a greater extent to the citizens of the U.S.A. Not only the individual worker will be assured of medical care, but all the members of his immediate family. The merit of the scheme is that doctors will not be required to be employees of the Government and the patients will be free to choose their own doctors. The scheme is to be administered by a National Health Insurance Board consisting of five persons and it will work in consultation with a National Advisory Medical Policy Council.

In India we have the Employees' Insurance legislation but this is less limited in scope and much less comprehensive. Health of the Indians is in a very deplorable condition and it calls for reorganisation on a nation-wide scale. It is a pity that health is a most neglected subject in our budget as only 0·7 per cent of our total revenue goes to the public health expenditure.—*Hindusthan Standard.*

ANTI-V. D. CAMPAIGN IN WEST BENGAL

The Anti-V. D. campaign of the Government of West Bengal launched in January, 1944, with the object of combating the growing venereal menace and the deplorable ignorance and callousness in the attitude of the common people to this fell disease, is now five years old.

A report of the activities during the year 1948 states that the pre-partition set up has been duly refashioned with a view to furthering the anti-V. D. measures. Briefly the activities fall under three broad heads: Medical, Educative and Legislative.

Under medical measures altogether 13 clinics functioned in the province—10 in Calcutta and 3 in the districts of Darjeeling, Hooghly and 24-Parganas, the last two being situated at Serampore and Kankinara, catering the mill areas. Two other clinics were also sanctioned for the largest districts, Midnapore and Burdwan. Of the treatment centres in operation the 82-bedded Special Hospital at Anpore deserves special mention in this connection. Formerly this hospital used to cater for public women only, but for some time past it has been working for other male and female patients. It is the only indoor hospital under the Anti-V. D. Campaign and functions as a Central Clinic also where cases referred to from other clinics are admitted, if hospitalisation is deemed advisable. All cases of gonorrhoea and cases of syphilis with pregnancy are given penicillin treatment in this hospital.

Treatment of Patients—The total number of patients treated during the year under review was 2,25,944 as compared to 1,76,043 of 1947 and 2,71,526 of 1946 in the undivided Bengal. The number of new cases treated during the year was 35,381 of both sexes, as against 29,662 in 1947 and 38,417 in 1946. Again, of the 32,519 new cases of 1948, 22,074 were males and 9,545 females.

The number of arsenical injections given during the year was 47,776 and the number of blood tests for syphilis conducted during the year was 18,297.

An analysis of the profession of new cases treated during the year, 22,974 males and 9,545 females is

interesting: *Males*—(1) Business men and professionals, 4,410; (2) Clerks, shopkeepers, etc., 3,885; (3) Students, 1,246; (4) Labourers, 9,901 and (5) Domestic Servants, 3,562; total, 22,974.

Females—(1) Housewives, 6,393; (2) Prostitutes, 1,444; (3) Students, 142; (4) Clerks, Shop-assistants, telephone girls, etc., etc., 91; (5) Labourers, 532; (6) Domestic Servants, 663; (7) Vagrants, 158 and (8) Dependants in miscellaneous capacities, 131; total, 9,545.

Social workers, both male and female, formed an integral part of the campaign and helped the doctors in the clinics as usual and kept themselves engaged in contact-tracing, case-holding and following-up. Other staff of various cadres also acquitted themselves creditably in the year. The Refresher Course in Venereology, introduced in the early part of the Campaign, was not undertaken in the year under review.

Legislative Measures—On the Legislative side the West Bengal Undesirable Advertisements Act was passed to prevent advertisements holding out prospects of "quick and guaranteed" cure of such diseases. The police rendered effective help in checking surreptitious current of commercialised vice and on several occasions raided the so-called "Massage Homes" of the City.

The Anti-V. D. Campaign has provided opportunities of scientific cure under governmental care. But it is manifestly inadequate in comparison with the gradual spread of the disease among the middle class people and the absence of V.D. treatment centres in the mufassil. The benefits of the campaign should be made available to the people in the districts and the blood test of expectant mothers should be undertaken as widely as possible to ensure a healthy generation in the future. The measures so far adopted have only touched the fringe of the problem there being ample scope for research and further field-work in this campaign.

COMBATING DISEASES OF S.-E. ASIA

W.H.O.'s Programme for 1950—Dr. A. Lakshmanaswami Mudaliar, Vice-Chancellor of Madras University and the newly elected Chairman of the Executive Board of the World Health Organization, on his return to Madras on the 25th July last after attending the W. H. O. Conference at Rome as a member of the Indian delegation stated that the work already started by the W.H.O. to eradicate malaria and tuberculosis and for improving maternal and child welfare in the South-East Asian zone would be intensified during the next year.

Preventible Diseases—Dr. Mudaliar said that the programme of work laid down by the W.H.O. for 1950 consisted mainly of measures for the eradication and control of preventible diseases and for technical training of the personnel needed for different countries. High priority, he said, had been given to diseases like malaria, tuberculosis and venereal diseases, while maternal and child welfare and environmental sanitation would receive special attention.

Fellowships would also be awarded for special studies in different countries so that trained personnel would be available in the several branches of public health.

A special committee for combating cholera, he said, would meet in South India, probably in Madras, in September or October this year. Specialists were expected to visit the countries of South-East Asia to discuss with the health authorities of those places various aspects of combating some of the common diseases prevalent in these regions.—*P.T.I.*

DIAGNOSTIC LABORATORIES

The Rockefeller Foundation is sponsoring a study of the activities of diagnostic laboratories (Public Health) all over India. The object is to evolve a way of standardising their work so as to have concordance in the results sent out.

Dr. G. V. Nataranjan, Deputy Director of Public Health in Mysore, has been invited by the Foundation to undertake a study tour for four months beginning in the middle of August. He will visit the laboratories in Belgaum, Bombay, Kasuali, Shillong, Calcutta, Madras, Colombo, Travancore and Coonoor and if possible those in Pakistan also.

The particular problems that he will investigate are essentially three: Uniformity has to be secured in the technique of assessment of result as is done in standard methods in the United States of America. Examination of water and reading of results should be uniform throughout India both to see that potable waters are safe and pollution of rivers brought to the minimum.

Preparation of vaccine and sera has to be stepped up to as large a scale as possible to meet the epidemic and normal demands from local available strains. The imports of foreign vaccine and sera have to be brought down to the minimum.—*Hindusthan Standard.*

REVIEWS

THE 1948 YEAR BOOK OF GENERAL MEDICINE—Edited by Paul B. Beeson, J. Burns Amberson, George R. Minat, William B. Castle, Tinsley R. H. Vorison and George B. Eusterman. D. C. 16 vo., p. 821. Published by the Year Book Publishers Inc. 304, South Dearborn Street, Chicago. Price $4·50.

The Year Book of General Medicine is an annual feature among many other similar publications.

Successful treatment of epidemic typhus with chloromycetin is reported. Chloromycetin is a neutral compound stable in aqueous solution for over 24 hours at pH. range 2-9 and is unaffected by boiling for 5 hours. To one youth aged 18 years and weighing 46 kg. 1·5 gm. of chloromycetin was given orally once a day for 2 days. The petechiae of typhus appeared on the sixth day. On the second day of treatment fever and symptoms subsided. On the 4th day the patient was discharged. Chloromycetin was also given by slow intravenous injection in some cases. Three hours after the first injection, headache and backache had disappeared and vision was normal. Oral administration was equally effective but it was 8-12 hours before results were evident. The authors conclude that chloromycetin is a safe antibiotic for intravenous medication when given in doses of 10 mg. per kg. body weight for three days. Indications are that the oral dose may be increased to at least 15 mg. per kg. body weight for the same length of time.

Due to widespread use of penicillin reports of penicillin-resistant strains of staphylococcus pyogenes are increasing. Barber reports that of 100 patients with staphylococcic infection, 38 yielded penicillin-resistant strains. In all 38 cases the degree of resistance was gross and all strains except one which was not tested, produced penicillinase. These findings suggest that staphylococcic infections may become more difficult to treat with penicillin in the future.

In experimental plague streptomycin has been found to be the most effective therapeutic agent. In a concentration of 0·4-4 micrograms per c.c. it is bactericidal for different strains of pasteurella pestis in five days. Advanced bubonic plague in mice is cured with 500 micrograms every three hours for three days (total 120 mg.). Between 80 and 90 per cent of mice with septicaemic plague may be saved with a total of 1200—1600 micrograms.

In 1947 bubonic plague broke out in Haifa and Affuli, Palestine. 3 cases were treated with streptomycin. It was given in 200 mg. doses every three hours. The bubo resolved without incision. In two other cases incision was necessary. In all streptomycin had a good effect on the general condition.

In an epidemic of pneumonic plague in Mukden 1946, report of 39 cases is available. This epidemic occurred while Russian armies were evacuating the region. All the cases had classical symptoms of pneumonic plague. Treatment with sulphadiazine was effective in three or five patients. The patients who recovered received sulphadiazine from the first day of illness for approximately 16 days.

U. S. Navy's War record with tetanus toxoid is now available. The use of alum-precipitated tetanus toxoid in immunisation of Navy personnel during World War II resulted in almost complete elimination of tetanus. In World War I the average morbidity rate for the German army was 380 per 100,000 wounded with about 300 deaths per 100,000.

The Year Book is full of useful informations for a busy practitioner.

B. P. NEOGY.

CORONARY ARTERY DISEASE—By Ernest P. Boas and Norman Boas. D. C. 16 vo., pp. 399. Illustrated. Published by The Year Book Publishers, Inc. 304, South Dearborn Street, Chicago. Price $6·00.

Coronary artery disease is on the increase. It is thought that the progressive aging of the population is contributing to a steady increase in the number of patients with coronary anteriosclerosis.

Basic facts about the clinical picture of heart disease are incorporated in text books. In this monograph an attempt has been made to synthesise the present knowledge of the coronary circulation and its disorders and the effect of these disturbances on the heart.

The book is divided into 17 chapters. The authors start from embryology and then describe the anatomy and physiology of the heart before beginning the main subject. While discussing precordial pain not caused by coronary disease the authors described a form of heart pain which they call "benign heart pain." This is a type of pain which used to go under the name of pseudo-angina, reflex angina etc. Allbutt vividly drew the picture in the following words "these faintnesses, palpitations, gaspings, stifflings, bodily agitations, hyperæsthesias, and psychical commotions are as wholly unlike the ruthless grip of angina pectoris as their frantic alarms are unlike its silent passions."

The chapter on treatment is well distributed. The treatment with thiouracil is elaborately discussed.

The book will be useful to physicians as well as the cardiologists.

B. P. NEOGY.

CURRENT MEDICAL LITERATURE

Coronary Thrombosis

The Hunterian Society on 20-3-49 heard Dr. William Evans—plead not for the first time—that what is loosely termed coronary thrombosis should be called cardiac infarction; for the infarct giving rise to the familiar and dramatic syndrome is commonly due, not to thrombosis at all, but to blockage of a coronary artery through aortitis. Dr. Evans expressed the view, which was highly acceptable to his listeners, that smoking has no effect on the cadiovascular system; nor, he added, will sudden exertion precipitate infarction from atheroma. In the treatment of the initial pain morphine is the supreme anodyne, and it should not be spared; gr. ¼ should be given at once, and if the patient does not become pain-free and fall asleep this dose should be repeated after half an hour and, if need be, again after a further half hours; but if this third injection is needed the infarct is large and the prognosis grave. Dr. Evans does not believe that atropine provides any special benefit; and he stoutly denies that nikethamide has any place whatever in cardiovascular practice, even though coroners are gratified to learn that it has been injected. Quinidine should not be administered as a routine; but digitalis should be given where heart-failure arises, as it does in a fifth of the cases. He opposes the use of anticoagulants, to which most patients, in his view, are either resistant or sensitive. Six weeks is probably about the right period for the patient to be confined to bed. As to long-term therapy, half a tablet of trinitrin chewed before exertion that normally induces angina will often prevent its onset; thus anginal attacks may be reduced from, say, 6-8 per day to 2.

Discussing long-term management, Dr. Geoffrey Bourne advised measurement of the heart size as a guide to treatment; if the heart is not much enlarged and if on serial examination it does not increase in size, then the prognosis is correspondingly better and treatment can be more vigorous; with an enlarged heart, even if the patient is symptom-free, treatment is unlikely to prove so satisfactory. The second guide is the blood-pressure, and particularly the diastolic pressure; the chance of success in treatment is best with a fairly normal pressure. The patient should be encouraged slowly to find his own physical level. Dr. Bourne imposes no veto on the consumption of alcohol, or of food provided that the stomach is not overfilled; but he is more wary of tobacco than Dr. Evans, having seen two patients who reported that before the attacks the warning retrosternal pain was induced by half a cigarette. Fat patients should set about reducing their weight. A common sequel to infarction is effort syndrome, with a heavy precordial pain lasting 2-3 hours at a time, and possibly aggravated by exercise and associated with pain down the arm; here careful history-taking should be followed by reassurance. The intelligent patient should be told what is happening, and that healing will take time. Incalculable harm had been done by hesitation and pessimism; possibly egoistical pleasure underlies the grave head-shaking which drives patients into chronic invalidism. The attitude has to be one of unwavering optimism: the patient should be told not about his chance of dying but about his prospect of surviving.

Mr. George Mason related his experiences in establishing a collateral extracardial circulation, and illustrated his theme with a film of patients engaged in impressive physical exercises several years after omentopexy. It was left to Dr. Jenner Hoskin, who some twelve years ago took a leading part in a similar discussion by the same society, to recall that except for minor advances little had been added in recent years to the understanding of cardiac infarction.—Lancet, **1**:532, 1949.

Neurocirculatory Asthenia, Anxiety Neurosis or the Effort Syndrome

Cohen and others (*Arch. Int. Med.*, **81**:260, 1948; Ref. *Am. Heart J.*, **37**:838, 1949) write that an attempt is made to summarize certain major positive findings (physical, physiological, subjective, and objective) which the authors have observed in a five-year study of neurocirculatory asthenia. The confused terminology regarding this condition is discussed and the various synonyms described. The exact limits of the terms so used are not clearly defined, but they all refer to a type of disorder in which several of the following features are striking: nervousness, easy fatigue, shortness of breath, palpitation, spells of faintness, giddiness, apprehension, poor muscular work performance and emotional stress. However, all or any of these symptoms are not associated with any diagnosable disease of the heart, lungs, nervous system, or thyroid gland.

The authors studied 144 patients with an average age of 26·9 years. Abnormal findings were few and such positive findings that were present occurred in a high percentage of cases. These findings included a high resting pulse rate, increased respiratory rate, flushed face, hyperactive knee jerks and ankle jerks, and tremors of the fingers. In contrast to these findings was the multiple nature and high incidence of subjective symptoms. Studies of muscular work demonstrated a defect in aerobic metabolism in all grades of work. Pulmonary ventilation was abnormal as was awareness of dyspnœa. The pulse rate for all grades of exercises was abnormally high. Heart size, electrocardiograms, resting circulatory measurements, and cardiac output were all normal. Quantitative studies of pain revealed an abnormal reaction to painful stimuli. All patients diagnosed as having neurocirculatory asthenia were placed in the "neurosis" category on psychological testing.

Statistics revealed a definite familial incidence with an almost "Mendelian" hereditary pattern, and the authors do not believe that environment and experiences have been demonstrated to be the major factors in causing the disorder.

From a prognostic viewpoint, a convenient distinction is made, on the basis of history alone, between acute and chronic neurocirculatory asthenia. Those diagnosed as having an acute disturbance demonstrated more nearly normal observations than did patients with chronic disease. Strong emphasis is placed on the determined fact that basal measurements made with the patients resting may not show abnormalities, while measurements made with the subject under stress may show marked differences; the stronger the stress, the greater the deviation from normal. No specific effective curative measures are proposed.

Cholesterol in Coronary Disease

Plotz (*J.A.M.A.*, **139**:623, 1949) discusses the role of high fat diets in the pathogenesis of coronary disease. Ten patients are presented in whom death followed within several months after starting a diet high in fat. All of these patients had previous coronary diseases. In another series of 17

patients with coronary disease in whom peptic ulcer developed, the symptoms of coronary disease became worse within three months after a high fat diet was instituted.

As a rough comparison, 17 patients with known coronary disease who had been placed on special diets for impaired gallbladder function were selected. Three months after starting their high fat diets, two of these had a deterioration of their cardiac condition, one of them a fresh myocardial infarction. It is suggested that perhaps the low cholesterol diet of the Chinese and the Okinawans may have something to do with the rarity of coronary disease among them.

The incidence of coronary disease diminished both in Germany and England when the dietary fat was low. The author also states that there is considerable evidence that there is some sort of connection between coronary atheromatosis and cholesterol metabolism, and that it is a matter of common clinical observation that in those conditions in which the level of blood cholesterol is elevated, the incidence of coronary atheromatosis is much higher. It is therefore concluded that as at least a precautionary measure, the conventional ulcer diet should be avoided in patients who are likely candidates for coronary atheroma, xanthomatosis, and hypercholesterolemia. Further investigation is recommended.

Vitamin E in Heart Disease

Baer and others (*Am. J. Med. Sci*, **215**:542, 1948) write that vitamin E in 300 to 400 mg. doses daily was used in the treatment of 11 patients with congestive heart failure, 5 patients with angina pectoris and 6 patients with hypertension and/or arteriosclerotic heart disease.

In no case was there any demonstrable effect on the electrocardiogram, orthodiagram or blood pressure.

None of the 22 patients was markedly or moderately improved. Six patients were questionably improved and the remainder showed no change or became distinctly worse.

The results were not encouraging enough to recommend the use of vitamin E in the treatment of angina pectoria congestive failure or hypertension.

Nutritional Diseases in Canadian Troops Held Prisoner of War by Japanese

Crawford and Reid (*Canadian J. M. Research*, **25**:53, 1947, Ref. *Trop. Dis. Bull.*, **46**:71, 1948) record in Hong Kong, as in other prisoner-of-war camps in the Far East, the effects of malnutrition developed against a background of intercurrent infection and excessive physical work. The diet is described in general terms: throughout the period of imprisonment it was deficient in calories, fat, animal protein and vitamins, being worst at the beginning, in 1942. The authors have not attempted, to estimate the intake of individual nutrients. nor to correlate intake levels with the appearance of the various deficiency states.

The greater part of the report is devoted to a detailed and objective description of the nature, course, and response to treatment of the symptoms and signs of deficiency. Preconceived ideas about aetiology and the role of specific vitamins have been scrupulously avoided. The value of the work is further increased by the fact that in some cases it was possible to make follow-up observations after repatriation of the troops to Canada.

The first symptoms to develop were *urinary urgency, inefficiency of the sphincter, polyuria, and nycturia* (nocturnal polyuria). These first appeared after only a week of imprisonment, and continued until 1945. Nearly 100 per cent. of the man were affected. The average urine volume was 6-8 litres in 24 hours. Nycturia was relieved whenever there was an increased intake of meat. The symptoms were worse in cases with gross neurological disturbance.

Next *oedema* appeared. (The time sequence is to be noted. Sinclair has described nycturia accompanying famine oedema in Holland and Germany but say nothing about which came first). Nearly 80 per cent. of the camp population were affected. At first oedema responded well to rest in bed, and dramatically to intramuscular injections of thiamin. After 1942, however, many cases were resistant to thiamin. It is suggested that these may have been caused by protein deficiency.

Cardiac changes, such as tachycardia, arrhythmias, and systolic murmurs, were common, but there was little clinical evidence of cardiac enlargement. In patients with infections, cardiac collapse was the common cause of death, and it was estimated that the cardiac age was advanced 20 years. Acute cardiac failure does not seem to have been found in the absence of infection. All the cardiac signs responded to treatment with thiamin.

Neurological changes developed at an early stage. These included paraesthesia, glove-and-stocking hypoaesthesia, calf-tenderness, and changes in the deep reflexes. Loss of visual acuity was common, accompanied by contraction of the visual fields and scotomata. When ophthalmoscopic examination became possible, optic atrophy was found in some cases. An interesting observation is that, although there were no complaints of deafness during the period of imprisonment, audiometric tests made after repatriation showed a diminished perception of high frequency tones.

A serious cause of disability was the condition known as *"electric feet"*. This conformed to the descriptions of "painful feet" in other P.O.W. camps. There was some evidence of vascular disturbance; the pain was worse at night, and was relieved by immersing the feet in water. Gangrene sometimes occurred. There was no response to vitamin B_1, but nicotinic acid, in doses of 20 mgm. each day intramuscularly reversed the progress of the syndrome. There has been conflict of opinion and evidence about the efficacy of nicotinic acid in this condition; the authors emphasize that in their cases, because of a probable impairment of absorption, the vitamin was given parenterally. It was noted that subjects of European stock who had been born in Hong Kong and lived all their lives there, were much less liable to "painful feet" than the troops from Britain or Canada.

As in other P.O.W. camps, *scrotal dermatitis and lesions of mucosa* were common. *Conjunctivitis* was sometimes accompanied by corneal ulceration, which responded to treatment with shark-oil. In the autumn of 1942 there was an epidemic of pellargrous dermatitis, which cleared up with nicotinic acid.

Swelling of the breast was found in a moderate number of cases. This first appeared in 1942, later became less frequent, and recurred after release and return to European food.

In conclusion, the authors discuss the question of *psychological* changes. They found no evidence of any specific emo-

tional disturbance; if anything, there was euphoria rather than depression.

Clinical Problems in Penicillin Sensitivity

Peck and others (*J.A.M.A.*, **138**:631, 1948) write that intracutaneous tests with penicillin and trichophytin were made in 406 adults and 91 children. Of these, 130 adults and 36 children had previously been exposed to penicillin. Thirty-two of these adults had cutaneous eruptions, twenty-five of which were of the urticarial type and seven of the erythematovesicular type. Of the twenty-five urticarial patients, most of whom were male, ten showed delayed (forty-eight-hour) reactions to intracutaneous tests with trichophytin. The seven patients with erythematovesicular reactions were all males and showed delayed reactions to both penicillin and trichophytin. No immediate wheal-type reactions were elicited in any of the subjects. Of 276 adults who had never had penicillin, fifteen gave delayed cutaneous reactions suggesting the presence of "spontaneous" sensitivity to penicillin. This form of sensitivity, probably the result of a former fungus infection, produces an erythematovesicular reaction and is frequently accompanied by a positive trochophytin test.

The delayed type of skin reaction may aid in determining whether a rash is due to penicillin or to some other agent. It may be of value in the diagnosis of "spontaneous" sensitivity and may serve as a guide to dosage for desensitization procedures, which are more often necessary with the erythematovesicular than with the urticarial type. The results of slow desensitization of procedures carried out on eight cases by both the subcutaneous and oral routes are reported.

Dietary Treatment of Cirrhosis of the Liver

Patek and others (*J.A.M.A.*, **138**:543, 1948) from an analysis of the results of 120 patients observed during a period of 10 years have chucked out a programme of treatment which is as follows:—On admission to the hospital the patient accepts bed rest without protest. He is usually mentally dulled, weak and distended with ascites. Fever and low grade jaundice frequently are present. With improvement, he asks for more freedom and he is allowed to be semiambulatory. Since hospitalization may require months, strict bed rest is not enforced for more than one half of the day.

Chief emphasis is placed on the diet, a detailed scheme of which appeared in a previous report. In contrast to the traditional American diet prescribed for hepatic disease, which was high in carbohydrate but low in protein and fat, the present diet is rich in protein and ample in carbohydrate and fat. It contains 140 gm. of protein, 355 gm. or carbohydrate and 175 gm. of fat—a total of about 3,500 calories. The diet consists chiefly of meat, milk, eggs, fruit and green vegetables. Eggs are served with breakfast; meat, fish or poultry is served at dinner and supper; milk is served three times with meals and twice between meals, with 25 gm. of yeast, in the form of milknog. If the patient eats these foods, considered basic to the programme, the remainder of the diet is largely a matter of choice. The charting of the estimated food intake for each meal (1 to 4 plus) provides a stimulus to the patient and serves as a useful record. In certain cases a semisolid diet is indicated, and in a few, when the patient is drowsy or stuporous, a regimen of liquids is prescribed. Yeast is fed in graded increasing dosage until 25 gm. are fed twice daily. For patients who do not tolerate yeast (because of distention, diarrhoea or nausea) an orally administered B complex preparation is substituted. Thiamine hydrochloride (5 mg. daily) and unconcentrated liver extract (5 c.c. twice weekly) are injected intramuscularly. If the patient shows signs of severe polymeuritis or of mental confusion thiamine hydrochloride (100 mg.) and nicotinamide (300 mg.) are administered daily parenterally.

Patients with ascites are allowed fluids up to 2,000 c.c. daily or somewhat more in hot weather. Salt is moderately restricted by excluding its use in the preparation of food or on the tray. Abdominal fluid is tapped before the patient is greatly distended, since distention seriously curtails the appetite. Mercurophylline injection (2 c.c.) is given once or twice weekly and is combined with the daily oral administration of 4 to 6 gm. of ammonium chloride in enteric coated pills. Alcohol is interdicted.

In patients with cholæmia, slow intravenous infusions of 10 per cent dextrose are administered, totalling 2 or 3 liters in twenty-four hours. To each liter are added 100 to 150 mgm. of thiamine hydrochloride, 300 to 400 mgm. of nicotinamide and 100 mgm. of riboflavin. The regimen is discontinued when the patient is able to take oral feeding. In many cases cholæmia is precipitated by hæmatemesis or intercurrent infection, and in these cases the precipitating condition is treated vigorously.

For the care of hæmatemesis, transfusion of whole citrated blood by the slow drip method is performed as soon as possible, since delay may result in irreversible collapse of the patient. Transfusion is continued as long as there is evidence of bleeding. Plasma and dextrose (10 per cent) often are given intravenously as supportive measures. Food by mouth is withhold for two or three days. The patient is only lightly sedated, since he has a tendency to lapse into cholæmia.

Intercurrent infections formerly accounted for about 25 per cent of the deaths from cirrhosis. With the advent of sulphonamide and antibiotic drugs, the dangers from infection have been sharply decreased. In the present series, sixty-four courses of sulphonamide drugs were administered to 43 patients of whom 13 received sulphanilamide, 6 sulphapyridine, 8 sulphathiazole and 16 sulphadiazine. Pneumonia, phlebitis and cellulitis comprised the chief conditions treated. In 11 instances treatment with sulphonamide drugs was effective and may have prolonged life. Of these patients, 7 subsequently died of hepatic disease. Untoward reactions were experienced by 4 patients, 2 of whom were over 70 years of age.

Although instances have been cited of hepatic damage produced by sulphonamide drugs, the risk would seem to be justified when continued infection is the serious alternative. In this regard our experience confirms that of Peterson and his co-workers. However, since hepatic complications have not been described as the result of treatment with penicillin and other related antibiotics, these agents are generally to be preferred.

Specific Adjuvants.—The use of specific adjuvants for the treatment of cirrhosis of the liver has been reported in recent papers. It is difficult to evaluate effects from these agents, since in most instances the patients also received diets high in protein, similar to the diet employed in the present series. In an attempt to test these substances, 8 patients were selected the course of whose disease had become stabilized after three to twelve months of the standard dietary treatment in the hospital. They were in a state of constant non-progressive hepatic failure. Choline and methionine were administered, without changing the dietary regimen.

Three patients received 4 to 6 gm. daily of choline hydrochloride for six, eight and ten months respectively; 5 patients received 3 to 4 gm. daily of methionine for an average of three and six-tenths months. In 1 patient, who received methionine for seven months, slight clinical improvement was noted. No change was apparent in the others.

After an interval of at least three months (average period five months) subsequent trial of intravenously administered liver extract was carried out in 6 of these patients for two to eleven months. The average weekly dosage was 37 cc. in 5 cases and 200 cc. in the sxith case. In 3 of the patients the intravenous administration of liver extract was associated with gain in appetite and well-being and gradual disappearance of ascites. (These patients had received thirty-three, seventy-five and one hundred and twenty-six abdominal taps, respectively, preceeding intravenous treatment with liver extract). There was concomitant improvement in laboratory signs. Whether the improvement coincident with treatment could be ascribed to the introvenous use of live extract could not be proved.

In 4 other patients with signs of severe hepatic failure, intravenous treatment with liver extract failed to check the unfavourable course of their disease. Death occurred within one to three months of the inception of treatment.

Reports on the use of concentrated human serum albumin solution suggest that this substance may prove to be an effective aid in treatment of cirrhosis, particularly to alleviate ascites formation. Our own experience has been limited to studies of 3 patients who received 600 to 800 gm. each in fourteen to sixteen days. In these patients no sustained diuresis or therapeutic benefit was apparent, even though normal values for serum albumin were attained. These patients had an unusually protracted course, with ascites formation and other signs of hepatic failure. It is possible that more prolonged administration of albumin solution would have been effective.

Treatment of Alcoholics

Trials with a drug known as 'Antabuse' are described by a Copenhagen doctor in a recent contribution to the Lancet. The effect of the drug is to cause unpleasant consequences, including violent blushing, when a dose is followed by the imbibing of alcohol. What are described as promising results were obtained after six months of experiment on 74 out of 83 patients who had sought voluntary treatment for alcoholism. Most of the nine paients among whom the treatment failed suffered from serious psychic defects, and though they exhibited the usual discomfiture when they followed antabuse with alcohol, they lacked interest in the treatment and did not persevere with it. The investigation has so far been too short to ascertain whether the results are permanent and whether undesirable side effects follow the prolonged taking of the drug, though none has yet been noted, nor have any untoward systematic effects on the liver, heart, kidney, or blood-forming organs been observed to date. To sum up, it seems that if the drug lives up to its promising start, it will be possible to develop a medical treatment for alcoholism. Two Danish scientists, Dr. Jens Hald and Dr. Erik Jacobsen, working at a Copenhagen biological laboratory, discovered the senitizing effect of the drug.—J. Roy Inst. Jub. Health & Hgg. **12**:73, 1949).

Treatment of Migraine With Histamine

Macy and Horton (*J.A.M.A.*, **137**:1110, 1948) write that migraine is characterized by five fundamental factors: (1) periodicity, (2) cephalalgia, (3) gastrointestinal disturbances, (4) cortical disturbances, and (5) a familial history of migraine. The typical form of the syndrome is a periodic cephalalgia which is associated with at least two of the remaining three factors. Atypical migraine is a periodic cephalalgia associated with any one of the remaining three factors.

Two series of cases were reviewed in an effort to evaluate the effect of histamine therapy. The first series included 124 patients seen between the years 1937 and 1945 who were treated with subcutaneous or intravenous histamine, or with a combination of both. Patients treated with the subcutaneous and combined form of therapy were advised to continue subcutaneous therapy indefinitely. The second series consisted of a group of twenty patients treated from June to September, 1945. The treatment of this group consisted of intravenous therapy alone except in eight cases in which failure by the intravenous route was followed by subcutaneous treatment. Most effective therapeutic results were obtained in the atypical type of migraine. Subcutaneous therapy was more effective than intravenous, and combined therapy was more effective than either. Of the total 124 cases in Series I, forty-one were unrelieved and eighty-three noted improvement, rate as from 25 to 100 per cent. In Series II, five patients were unimproved while fifteen had significant improvement. Recurrence of symptoms was noted in eighty-five patients in whom adequate follow-ups were available. All had discontinued subcutaneous therapy against advice. The three patients whose attacks did not recur were still taking histamine subcutaneously at the time of the last report.

Topical Application of Benadryl

McCavack and others (*Arch. Dermat. & Syph.* March 1948, Ref. *M.J. Australia*, **1**:468, 1948) state that the powerful antihistamine action of "Benadryl Hydrochloride" has been repeatedly demonstrated in animals and in human beings with and without allergic diseases. The frequency of side effects of the drug, when given in adequate amounts by mouth, led the authors to investigate its topical use for diseases in which cutaneous manifestations of a probably allergic nature were present. In 63 cases the topical application of 2 per cent and 5 per cent concentration of "Benadryl Hydrochloride" in ointment bases reduced or completely destroyed the response of the skin to intradermally applied histamine. "Carbowax 1500" mono-stearate, an oil-in-water emulsion, appeared to be the best of the bases employed. Seventy-four patients with itching dermatoses were treated with ointments containing

"Benadryl"; 44 obtained complete relief from itching and 18 were improved. Six patients experienced some discomfort from the application of the ointment, particularly when a 5 per cent concentration was used. However, in four cases this lasted not more than five minutes. In the other two, it was due to the base employed in one and to an aggravation of a weeping eczematous disease in the other. No systemic side effects were observed.

Benadryl in Parkinsonism

Ryan and Wood (*Lancet*, **1**:258, 1948) writes that the results of treating 40 cases of parkinsonism with benadryl for more than a year suggest that this drug is most useful in this condition, and that it lacks the side-effects of the atropine group of drugs. The treatment is simple and laboratory control seems to be unnecessary.

Antihistamine Drugs in Nausea and Vomiting due to Streptomycin

Bignali and Crofton (*Brit. M.J.*, **1**:13, 1949) write that antihistamine drugs were found to relieve the nausea and vomiting which sometimes occur during treatment with streptomycin. This conclusion was supported by control tests in four severe cases. Giddiness due to streptomycin was not relieved.

Antihistamine Drug Treatment of Acute Nephritis

Craig and others (*Brit. M.J.*, **1**:6, 1949) give an account of the treatment with anthisan of eight cases of acute nephritis in children.

The course of these cases is compared with that of the nine consecutive cases of this condition seen in the same hospital during the period immediately preceding the institution of this treatment.

The duration of activity of the disease, as assessed by abnormal findings in the urine, is notably shorter in the cases treated with anthisan than in those of the control group.

Intravenous Paludrine (Proguanil)

Chaudhuri & Chkravarty (*Brit. M.J.*, **1**:91, 1949) write that paludrine acetate (soluble proguanil) was tried intravenously as an experimental measure in a series of 11 cases of malaria, all of which except two had *P falciparum* infection. The majority of the patients had either cerebral or gastro-intestinal complications and were not suitable for oral medication. Four of them were gravely ill.

Doses varied from 25 to 400 mgm., and were repeated in a few cases. The total amount of Paludrine injected was from 200 to 600 mgm. per case.

This series was too small for determination of the optimum dose, but in the majority of cases a dosage of 200 to 400 mgm. controlled the temperature and cleared the peripheral blood of a sexual parasites in two to three days.

One patient admitted in a morbund state died. Another patient, with typical cerebral malaria, remained unconscious for several days and later developed signs and symptoms of encephalitis, from which, however, he recovered completely.

The injections were well tolerated, but one patient (and another not included in this series) had some phlebitis of the injected vein, which subsided in a few days.

Recent Advance in the Treatment of Bubonic Plague

Wagle (*Indian J. Med. Sci.*, **2**:489-94, 1948) writes that the results of trials carried out at different times and places in India have satisfied the author that anti-plague serum of the Haffkine Institute, Bombay, sulphonamides and streptomycin, cause significant reductions in the plague fatality rate. The table shows the results observed in septicaemic cases; these are classified in accordance with the number of colonies grown from 0·25 ml. blood, cultured by a method described in the paper.

	Group I (1—10 colonies)		Group II (11—300 colonies)		Group III (over 300 colonies)	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Serum	29	7(24·1%)	30	17(56·6%)	12	12 (100%)
Sulphathiazole	41	9(21·9%)	61	23(37·7%)	30	23(76·6%)
Sulphadiazine	24	1(4·1%)	21	4(19·0%)	16	8(50·0%)
Streptomycin	12	0(0·0%)	9	0(0·0%)	11	3(27·2%)

Sulphapyridine gave less satisfactory results than the other sulphonamides; sulphamerazine gave much the same results as sulphathiazole, but the number of cases treated was small. Sulphadiazine was regarded as the best of the sulphonamide drugs, and streptomycin "is found to be the most effective drug in the treatment of bubonic plague in the light of present-day experience."

The dosage of sulphadiazine usually employed was 4·0 gm. initially, followed by 2·0 gm. four hours later, and then 1·0 gm. every four hours till the temperature had remained normal for two days, but the maximum duration of the course was 10·12 days. Treatment with this and the other sulphonamides was oral when possible; parenteral administration was reserved for patients unable to swallow, and it was considered advisable to give an initial dose of 2·0 gm. intravenously in every severe case.

Streptomycin was given intramuscularly; the initial dose was two-thirds of a gramme, then one-third of a gramme every

four hours till the temperature had remained normal for 24 hours; in severe cases the full initial dose was repeated every four hours till the temperature had remained normal for two or three days. The total dosage varied from 4·0 gm. to 25 gm., but the latter quantity was needed in only one exceptional case. Two patients developed a mild temporary psychosis, and another had a mild dermatitis, otherwise there were no toxic symptoms.

A Comparison of Sulphone and Hydnocarpus Therapy of Leprosy

Cochrane (*Internat. J. Leprosy,* **16**:139-44, 1948, Ref. *Trop. Dis. Bull.,* **46**:48, 1948) only considers the lepromatous class of cases in which sulphones have been favourably reported on. He concurs in the opinion of Schujman (*Ibid,* **54**:441, 1948) that the success of hydnocarpus treatment is largely dependant on dosage up to 400 c.c. in a year and on the use of the intra-dermal method. Six years' work showed 17·5 per cent negative and 40·2 per cent improved by equal dosage subcutaneously and intradermally, against 12·3 per cent and 34·2 per cent respectively with 15 c.c. of the oil injected per week, which is the optimum dose. Moreover, in 167 early lepromatous cases 84 (50·3 per cent) became negative under adequate dosage of hydnocarpus oil after an average of 94 weeks' treatment.

On the other hand, two years' trial of sulphones confirmed the work of Paget and others, although no case has yet become negative bacteriologically, so the time required to effect this is still too long; promin was the least satisfactory preparation and too toxic for Indian patients. Sulphetrone appears to be the drug of choice, for diasone precipitates reactions in 25 per cent of cases. The author prefers to commence with 4 tablets a day and increase by two every second day up to 12 daily and does not allow any rest period unless the red corpuscles fall below 3 million and the haemoglobin below 45 per cent. The bowels must be kept freely open as constipation may be dangerous.

The disadvantages of sulphone treatment are the necessity for close daily supervision and the present prohibitive cost for large numbers of Indian patients. The author therefore gave sulphetrone in an emulsion with 25 per cent arachis and 0·5 per cent beeswax to obtain blood levels of 1 to 3 mgm. per cent and skin concentrations of 5 to 12 mgm. per gramme of skin tissue on injection, by which means relatively small doses are required. Thus, in two similar cases much greater improvement clinically and bacteriologically was obtained by the injection of 70 gm. of a 25 per cent. suspension of diaminodiphenyl sulphone in eleven months than by giving 2,471·5 gm. of sulphetrone orally for 16 months. A method of examining sixteen smears from each patient to obtain a bacteriological index is advised for the control of results

The author therefore advises sulphones only in advanced lepromatous cases, especially those with nasal and laryngeal symptoms, and in cases not improving on adequate hydnocarpus treatment or who have relapsed. Intensive intradermal use of hydnocarpates is insisted on, as it accounts for the better results in lepromatous cases under hydnocarpates than under sulphones in Indian patients.

Radiation Sickness

Some of the immediate effects of radiation on the human organism are inhibition of enzyme action, death of dividing cells, changes in cell permeability, and reduced flow of saliva. To the patient the most unpleasant feature of radiotherapy is often the sickness which may make life miserable and interfere with treatment. The symptoms are nausea, with or without vomiting, and lassitude. The vomiting reflex is set in motion by abnormal stimuli to the afferent nerve endings, abnormal sensitivity of the reflex pathway at some point, or abnormal irritability of the muscles which are involved in vomiting. With nausea the same abnormalities are presumably present but below the necessary threshold to produce vomiting. Psychic factors have been suggested at the cause, but, while they may have an influence, no one with experience can consider that sickness due to the effects of radiation is not a real entity. The somatic changes must be chemical or nervous. There is no evidence, however, of a direct effect of radiation on the conduction of a nervous impulse. The possibility of inhaled toxic gases can be excluded with modern apparatus; and, since the vomiting frequently occurs when no radiation is given to the stomach or to any part of the reflex arc involved in vomiting, it seems likely that endogenous chemical changes are responsible. Whether the chemical abnormalities in the blood reaching non-irradiated parts of the body are due to irradiation of the serum, changes in cell permeability, actual breakdown of cells, or to the effects of irradiation on endocrine function is not known. The last is not a likely primary effect, since sickness can occur after irradiation of any part except the limbs, but it is possible that the chemical changes brought about by radiation might cause some hormonal disturbance.

The cause can probably be found in changes in the metabolism of cells which are sensitive to radiation. Sickness occurs most frequently after high doses to parts of the body which are very vascular, such as the neck, thorax, and abdomen. It has been noticed that quite small doses produce sickness in pattients with lymphatic leukaemia and to a less extent, myelogenous leukaemia; this suggests that the breakdown of blood cells, probably lymphocytes, may set free substances in the circulation which produce the vomiting. It is commonly held that histamine-like substances are primarily responsible for x-ray sickness, since tissue damage brings about their release. Indeed, histaminase has been used with moderate success as a remedy (Ellis, F.—*Brit. J. Radiol.,* **15**:174 and 194, 1942), and "benadryl" has been reported as efficacious (Lofstrom T. E. and Nurubenger, C. E.—*Am. J. Roentgenol,* **56**:211, 1942). Kullander (*Acta radiol.,* **26**:221, 1947), however holds a contrary view. He found that the vomit of patients with radiation sickness is usually hypo-or achlorhydric, though test meals showed normal gastric hydrochloric acid after the sickness had passed off. He also found that the administration of 20-40 minims (1·2-2·4 ml. of 7 per cent hydrochloric acid in water before meals and after X-ray treatment gave prompt relief. On the assumption that histamine would increase the secretion of hydrochloric acid he injected 0·125 mg. of histamine before meals; this also relieved the symptoms. If the effects of radiation were due to histamine-like substances, presumably the symptoms would have been aggravated by the injections. Brick (*New Eng. J. Med.,* **237**:48, 1947) has recently shown that large doses of radia-

tion to the stomach (2,500-6,000 r) may cause damage leading to ulceration and perforation, necessitating partial gastrectomy in some cases. This complication did not develop until 2-3 months after the radiation, and it was not associated with any lowering of gastric acidity. X-rays have been advocated by some authors for depressing gastric acidity during the treatment of peptic ulcer. Brick's work has demonstrated the danger of this procedure, and in any case, as Kullander has shown, acidity very quickly returns to normal after radiation. Any estimate of the value of remedies for radiation sickness must take account of the influence of secondary effects due to sepsis, loss of taste, interference with nutrition, and intestinal hyperactivity.

It has been claimed that many other remedies besides those already mentioned have given good results. Among these are sodium chloride, magnesium chloride, high carbohydrate diet, large amounts of fluid, vitamin C, vitamin B, and amphetamine. They have all had relatively short periods of popularity. A recent report on the value of pancreatin again suggests that the mechanism of digestion is disturbed. Pyriodoxin, given by mouth or intravenously, is at present the most popular and successful drug used for radiation sickness in this country. Maxifield and his colleagues (*Radiology*, **41**:38, 1943) in the U.S.A. first used it for this purpose, and its value was confirmed later by others. It counteracts the reduction in the white cells caused by radiation—vitamin C appears to have a similar action. Exactly how pyridoxin relieves radiation sickness is a mystery the solution of which may be of great biological importance. If hydrochloric acid can produce the same good results however, its cheapness and ease of administration should be in its favour.—*Brit. M. J.*, **2**:909, 1948.

Radiological Diagnosis of Gall-Bladder Disease

Greenwood and Samuel (*Brit. J. Radiol.*, **21**:438, 1948). from the analysis of the results in 500 consecutive patients referred for cholecystographic study. A standard proprietary radio-opaque substance given orally was used in all cases. Of 382 cases finally proved to be normal, 36 (9·9 per cent) were regarded as pathological with a single dose, but were shown to function normally with two further doses. It is therefore recommended that in all cases in which a single dose does not show a normally filled gall-bladder the three-dose technique should be adopted. Of 94 cases revealing positive evidence of gall-stones, 33 (35·1 per cent) showed gall-stones on the control film. Of the remaining 61, 11 (18 per cent) were demonstrable only in the erect position. It is therefore urged that "screening of the gall-bladder in the erect position using serial radiography and compression is essential in every examination of the gall-bladder." This technique among other things, minimizes the bowel shadows which can be so confusing in such cases. In cases in which bowel shadows are particularly confusing tomography may conclusively demonstrate gall-stones.

Chemotherapy in Peritonitis

Colvin and Wallace (*Surg. Gynec. & Obstet.*, **87**:440, 1948) from their experience over a period of a year (20 cases), recommend the following programme of chemotherapy in patients with peritonitis secondary to contamination from the alimentary tract, *i.e.*, as a result of perforation, trauma, or contamination during a surgical procedure: In early peritonitis with little contamination, 200,000 units of penicillin are left in the peritoneal cavity. By the intramuscular route 100,000 units are given preoperatively and two-hourly postoperatively for 10 to 12 doses. If all goes well, dosage is then gradually reduced to 100,000 units three-hourly for eight doses and then 50,000 units three-hourly for forty-eight hours. Sulphonamides are not used in this type of case. In cases of localized peritonitis with abscess formation both penicillin and sulphonamides are given; the former in doses of 50,000 to 100,000 units, intramuscularly every three hours, and the latter in the usual dosage, either orally or intravenously. For local application in the abscess cavity, 200,000 units of penicillin and up to 5 gm. of a crystalline sulphonamide are used. In case of advanced peritonitis with gross contamination of the peritoneal cavity and purulent exudate, penicillin, sulphonamides and streptomycin are all used as follows: Penicillin, 100,000 units intramuscularly every two hours, and 200,000 units left in the peritoneal cavity at operation. Sulphonamides, 1 to 1·5 gm. orally or intravenously every four hours; up to 5 gm. of the crystalline form in the peritoneal cavity. Streptomycin, 0·1 to 0·3 fim. three-hourly, or even up to 0·5 gm. in very severe cases.

Diagnosis of Carcinoma of the Lung

Woolner and McDonald (*J.A.M.A.*, **139**:497, 1949) give an analysis of 200 cases in which a diagnosis of carcinoma was made on the basis of examination of smears of sputum or bronchial secretions .In 190 cases a final diagnosis of bronchogenic carcinoma or pulmonary metastatic carcinoma was made. In 4 cases a carcinoma in the esophagus, larynx or trachea was demonstrated. In 4 cases the diagnosis was proved to be falsely positive. In the remaining 2 cases the final diagnosis was uncertain.

Exfoliated carcinoma cells in sputum or bronchial secretions provided the only preoperative microscopic evidence of cancer in 29 of 74 cases of bronchogenic carcinoma in which surgical exploration was carried out. In 13 cases of bronchogenic carcinoma in which the lesion proved removable, a preoperative diagnosis of cancer was based on the cytologic characteristics of sputum or bronchial secretions. In 6 cases of Pancoast's tumor and in 4 cases of alveolar cell tumor there were carcinoma cells in the sputum.

Cytologic examination of sputum is of great diagnostic value in the case of patients suspected of having bronchogenic carcinoma in whom bronchoscopic examination is contraindicated.

Acute Peritonitis

Altemeir (*J.A.M.A.*, **139**:347, 1949) writes that a review of the clinical experience during the past six years with 598 cases of acute septic peritonitis secondary to acute appendicits, perforated peptic ulcers penetrating wounds of the abdomen indicates that successful management depends primarily on early diagnosis and good surgical intervention and secondarily on chemotherapy and adequate supportive treatment. There is no specific therapy for this infection as yet, and chemotherapy

is not a substitute for prompt diagnosis and early operative repair or removal of the primary source of infection before abdominal distention, intestinal stasis and cardiovascular depression have occurred.

A comparison of the results obtained in 685 similar cases treated without chemotherapy with those in cases in which chemotherapy was used reveals that the mortality has been reduced approximately 60 per cent recently and that this reduction is apparently due to the effects of chemotherapy.

The most effective chemotherapy is obtained by the combined parenteral administration of sulfadiazine and penicillin or that of penicillin, sulfadiazine, and streptomycin. When used alone in a high dosage of 100,000 to 500,000 units every two or three hours, penicillin is effective in the great majority of instances, with the exception of those infections caused in part by virulent gram-negative bacteria.

A review of the previous experimental work suggests that expected effectiveness of penicillin in acute septic peritonitis is the result of a conversion of a severe synergistic and mixed infection into a similar one produced predominantly by gram-negative bacteria, usually of low virulence. The combined use of sulfadiazine and/or streptomycin with penicillin is recommended for the further control of this etiologic component of pertionitis.

Streptomycin in the Treatment of Chronic Infections of Bone

Wilson (*J. Bone & Joint Surg.*, **30**:931, 1948) writes that the purpose of this clinical study was to determine whether or not the use of systemic and local streptomycin, in addition to thorough sequestrectomy and meticulous wound care, would hasten the healing of wounds in patients ill with osteomyelitis of long duration.

Twenty-five cases of chronic osteomyelitis are presented, in which discharging sinuses had been present for an average of 19 months. Many types of treatment had been tried, without success. In an effort to promote healing, a plan of therapy was evolved upon the following principles:

(1) Thorough investigation of the wound bacteria; (2) radical sequestrectomy after adequate preoperative preparation; (3) the use of streptomycin and penicillin before, during, and after surgery; (4) meticulous wound care after surgery to prevent contamination.

Twenty-one patients have responded favourably to this regimen, and their wounds have healed. Four patients failed to respond; and all have had amputations.

The author emphasizes that the use of streptomycin offers no panacea for the treatment of chronic osteomyelitis. The drug is not a replacement for adequate surgery; but, when combined with thorough sequestrectomy, it is beneficial in the promotion of healing.

No statement is made with regard to recurrence of drainage in these patients. No claim is made that the course of the disease has been altered permanently or that a cure has been obtained in any case. However, the salutary response of the patients to this treatment, which allowed their prompt return to a healthy, useful life, has persuaded the author to present this study as a preliminary report—*U.S. Surg. News letter.*

Rhinoscleroma Apparently Cured with Streptomycin

New and others (*Ann. Otol. Rhinol & Laryngol.*, **57**:412, 1948) of the Mayo Clinic report a case of rhinoscleroma successfully treated with streptomycin. Rhinoscleroma is considered by many to be an infection; and organisms of the genus Klebsiella can usually be isolated from the lesions. In the case reported, the patient was a woman thirty-two years of age, who had lived in the Far East most of her life. A diagnosis of rhinoscleroma had been made in China in 1938; treatment with autogenous vaccine had resulted in an arrest of the disease for some time. When the patient was admitted to the Mayo Clinic in September 1946, both nostrils were almost completely obstructed with granulomatous tissue, there was scarring of the pharynx, and involvement of the larynx with almost complete obstruction of the airway at the level of the glottis. Culture of granulomatous tissue removed from the larynx by suspension laryngoscopy showed Klebsiella organisms in large numbers. *In vitro* tests showed these organisms to be sensitive to streptomycin. The patient was treated with streptomycin in a dosage of 250 mg. every three hours; treatment was discontinued after the first week because of the development of joint pains, a skin rash and fever. After twelve days' rest streptomycin therapy was resumed and was continued for forty-three consecutive days, a total dosage of 97·25 gm. It was discontinued at that time because of dizziness and slight nausea. There was definite improvement in the nasal condition after 38 gm. of streptomycin; after 53 gm. had been given there was a good airway and while the larynx showed some scarring there was no evidence of active disease. At the time streptomycin was discontinued, cultures from the nose and from the larynx were negative for Klebsiella; there was no granulomatous tissue present in the nose, but cicatricial scarring of the nostrils made a plastic operation necessary. There was no evidence of active rhinoscleroma when the patient was last seen approximately ten months after the completion of treatment. This appears to be the first case of rhinoscleroma reported as probably cured with streptomycin.

Granuloma Inguinale with Streptomycin

Jacoby and others (*Am. J. Syph. & Ven. Dis.*, **33**:76, 1949) write that a total of thirty-seven patients were treated in the outpatient clinic with intramuscular injections of stremptomycin in either an oil-beeswax mixture or an aqueous solution on each of seven to twelve consecutive days, omitting Sundays. Adequate blood levels were obtained for a minimum period of twenty-four hours. The majority of patients showed prompt symptomatic improvement. Two of this group failed to return for final evaluation and one is still under treatment. Of the remaining thirty-four, thirty-two were eventually cured, twenty-eight of these after primary treatment and four after re-treatment following relapse. Two

are still not cured. Although this number is not sufficient on which to base any final conclusions as to value of therapy, yet the high percentage of primary cures and re-treatment cures after relapse shows a sufficiently favourable trend to indicate that this is a valuable therapeutic measure in granuloma inguinale. In addition, equally favourable results in hospitalized patients reported by other investigators support this conclusion.

A daily dose of 3 gm. of streptomycin for seven to twelve consecutive days injected intramuscularly in ambulatory patients is a satisfactory method of treatment for granuuloma inguinale.

Differential Diagnosis of Dental Pain

Passtti (*Dental Digest*, Ref. *Indian Dental Rev.*, **19**:49, 1949 1949 gives in the following table the differential diagnosis of dental pain:

Conditions	*Character of pain*	*Site of pain*	*Type of pain*	*Local tenderness*	*Effect of posture*	*Effect of thermal impulses*
Pulpitis	Sharp and stabbing	Tooth affected but may be referred to any tooth on the same side of the head	Intermittent with periods of remission	May or may not be present	Recumbent position intensifies pain	In early stages cold intensifies pain; in last stages, heat
Pericementitis	Dull and throbbing	Tooth affected	Constant, increasing with percussion	Slight to severe	Exercise or recumbent position intensifies pain	Cold may relieve pain; heat does not materially affect it
Abscessed tooth	Slight to severe throbbing	Tooth affected	Constant	Mucosal edema over affected tooth	Recumbent position intensifies pain	Both heat or cold may relieve pain
Pressure from impacted tooth	Slight to severe	Area of impaction but may be referred to ear or neck	Constant	Usually negative	None	None
Pericoronal infection	Mild to severe	Soft tissues around area of affected tooth	Constant	Mild to severe	None	None
Tic douloureux	Severe to excrucialing	Distribution of trigeminal nerve	Spasmodic and of short duration	Extremely sensitive	Slightest movement of face or tongue may incite pain	Temperature changes may incite pain

Incoordinate Uterine Action

Jeffcoate (*Lancet*, **1**:482, 1949) at a meeting of the Edinburgh Obstetrical Society held on 9-2-49 with Dr. E. C. Fahmy, read a paper on incoordinate uterine action in labour.

Professor Jeffcoate criticised the use of the term "uterine inertia" on the score that incoordinate uterine action was often associated with high muscle-tone, especially in the middle and lower zones, or with spasmodic violent contractions, or with a constriction ring. The clinical picture was one of prolonged labour with slow dilatation of the cervix, despite the presence of strong uterine contractions and the absence of gross disproportion. Pain, which was unusually distressing, was felt predominantly in the back; sometime, when it assumed a down-bearing nature before full dilatation of the cervix, it appeared to arise through spasm of the lower bowel. All degrees of incoordinate action might be found; and it was particularly liable to occur in the presence of disproportion.

Of 101 cases observed in Liverpool, 62 were seen in private practice and 39 in hospital. The incidence in hospital cases was 4·6 per cent; the condition was seen more often in private practice, but it was not possible to work out any very reliable figures of its incidence here. The disorder was almost entirely confined to primigravid patients, but the aeticlogical influence of advancing age had been exaggerated. Premature rupture of the membranes did not appear to be a direct cause since this occurred in only 22 cases, whereas in 56 the disordered action of the uterus was recognised prior to rupture. Indeed, even when the membranes were unruptured the uterine disturbance was sometimes enough to cause embarrassment of the foetus. The significance of the occipitoposterior position as a cause of incoordinate action had been confirmed, and delayed engagement of the head in occipito-anterior position was noted often.

The maternal and foetal dangers of this condition had diminished with the introduction of chemotherapy, better general care of the parturient, caution over anaesthesia, and readiness to resort to caesarean section late in labour. Nevertheless, the dangers were still present, although in the two series no mothers died and the foetal loss by stillbirth and neonatal death was only 12 per cent. Professor Jeffcoate estimated that but for caesarean section the foetal mortality would have been in the neighbourhood of 50 per cent.

A further series of cases had been investigated in respect of remote prognosis. Of 140 severe but non-fatal cases requiring caesarean section or forceps delivery during the years 1936-46, 91 had been traced. As a result of their experiences

more than one-third of these patients decided to avoid further pregnancy; only half had further children. As regards this voluntary infertility, there was little difference between the caesarean-section group and that in which forceps had been used; but all the women had lost their first children tried subsequently to conceive, while contraception was practised only by those who had a living child. A few women embarked on further pregnancy only when promised that delivery would be by elective caesarean section In general terms the follow-up showed that in a large proportion of cases the behaviours of the uterus was much more efficient in the second labour, and that whereas caesarean section might be necessary in the first labour there was a good chance of vaginal delivery in the second. The ease of the second delivery appeared to be to some extent proportional to the stage of dilatation reached by the cervix at the first labour. When full dilatation had been attained, even if the baby had been delivered dead and with difficulty, the second labour was usually easy. Caution was therefore necessary in advising elective caesarean section solely because of a "bad obstetric history."

In the control of disordered uterine action; the administration of analgesics and antispasmodics, particularly morphine and pethidine, remained the chief line of attack. Professor Jeffcoate reported generally disappointing results with intravenous magnesium sulphate, trinitroglycerin, and oestrogens. After intravenous administration of dilute solutions of oxytocin in glucosesaline, as recently advocated by Theobald and others, two of his patients had suffered most severe pain without any change in the nature of the contractions, which remained incoordinate. In each of 11 cases tetraethyl-ammonium chloride had appeared to produce a strong and sustained uterine contraction, sufficient in 1 case to cause alarm for the patients experienced more frequent, and apparently stronger, uterine contractions for up to one hour; but again there was no evidence of alteration in the nature of the contractions, and 2 cases of constriction ring persisted.

Professor Jeffcoate criticised the contention that fear and emotional tension were important in the aetiology of incooordinate uterine action; for this condition did not recur in deliveries after the first, even when the first had been sufficient to daunt the stoutest heart. He thought that an unnatural resistance of the soft tissues of the lower part of the uterus might be more important than neuromuscular imbalance resulting from fear. In conclusion he classified inefficient uterine action under the headings of (1) inertia proper (2) incoordinate uterine action, and (33) cervical dystocia.

5000 Deliveries without Maternal Death

Emblin (*Brit. M. J.*, 1:251, 1949) writes that along the lines suggested by the Royal College of Obstetricians and Gynæcologists (1944) they have attempted to bring about the integration of the hospital, antenatal, domicilary, and specialist services in the Halifax Municipal Obstetric Organization. Their findings are:

Between Sept. 12, 1946, and Oct. 5, 1948, there were 5,000 deliveries after the twenty-eight week without a maternal death due to pregnancy.

The stillbirth rate in the series was 23·07 and the neonatal death rate 11·91.

A brief summary of the treatment of some major complications has been given.

Ante-partum Hæmorrhage—This condition is treated conservatively until there is a definite indication to intervene. In all cases, when first seen, blood is immediately taken for grouping and cross-matching. Vaginal and rectal examinations and the giving of enemata are strictly forbidden. When it becomes necessary to intervene—*e.g.*, in the case of small recurrent hæmorrhage—every patient, no matter how good her general condition, has an intravenous drip started. With blood ready to be given, the patient is examined vaginally under anæsthesia in the operating theatre. If her condition is grave from loss of blood this examination is omitted and cæsarean section is performed. In eight years, with a total of 12,830 deliveries in the hospital alone, onyl one case of ante-partum hæmorrhage has been lost, and that death occurred in 1944 from concealed hæmorrhage, and therefore does not come into this series.

Placenta Prævia—This is treated almost always by rupture of the membranes or by cæsarean section. The lower-segment operation is the one invariably used. Application of Willett's forceps and plugging with the half-breech are used only on very rare occasions. Packing and the insertion of an intrauterine bag have never been practised.

Accidental Hæmorrhage—This is treated by morphine, "pitocin", plasma or blood transfusion, and rupture of the membranes. Only once in eight years has it been necessary to perform cæsarean section and only once to carry out a cæsarean hysterectomy for this condition.

Post-partum Hæmorrhage—An attempt is made to prevent third-stage hæmorrhage by giving "pitocin", 1 ml. intramuscularly, in the following conditions the moment the child's shoulders are born: prolonged labour, uterine inertia, overdistension of the uterus, delivery under anæsthesia, the presence of fibroids in the uterus, and in any patient who has anæmia. Cases of placenta prævia and accidental hæmorrhage receive ergometrine, 0·25 mg. intravenously, as soon as the anterior shoulder has been born. If the placenta is not ready for delivery in half an hour from the birth of the child, or if there is even slightly more than the average amount of bleeding, "pitocin" is given as described above. If the placenta fails to be delivered promptly after the "pitocin" manual removal is carried out. Should the bleeding be heavy and the uterus atonic, ergometrine, 0·25 mg., is given intravenously. So far the intravenous ergometrine has been successful in stopping the bleeding in every case except the one complicated by acute myeloblastic leukæmia. Resuscitative measures can then be undertaken, and the administration of ergometrine does not, in my experience, make a manual removal any more difficult should this be required. Bleeding after the delivery of the placenta is treated by intravenous ergometrine. Intrauterine douches are never used.

Pre-eclampsia and Eclampsia—Emphasis is placed on abnormal gain in weight as an early sign of pre-eclampsia. On an average the weekly gain should not exceed 8 oz. (225 g.). The maximum normal systolic blood pressure is taken as 120 mm. Hg. and the diastolic as 80 mm. Hg. Oedema is always considered to be pathological, and when, in the absence of pus, there is albumin even in the smallest amount in the catheter specimen the disease is far advanced. Pre-eclamptic patients are treated by absolute rest in bed in hospital, with a low sodium and low-protein diet and sedatives. Of the seda-

tives chloral hydrate and potassium bromide and "nembutal" are the most commonly used. If there is vomiting, sodium phenobarbitone, 3 gr. (0·2 g.), is given intramuscularly. Liberal use is made of 20 per cent glucose solution in water intravenously in severe cases or in those with gross œdema. Ammonium chloride is also given for the latter condition. If the maximum diuresis is to be secured by the concentrated glucose solution a whole litre must be run into the vein in from 30 to 50 minutes. No attempt is made to interrupt the pregnancy unless the mother's condition is deteriorating. By following this rule the incidence of prematurity in these patients has been greatly reduced. I do not believe that chronic nephritis or permanent vascular damage is ever caused by pre-eclampsia or eclampsia nor is a latent hyperiension made manifest or "unmasked" at an earlier age by the pre-eclamptic pregnancy.

It cannot too strongly condemn rupture of the membrances in a patient with a long closed cervix. Rupture of these to induce labour in this condition should be done in only those cases in which the cervix is taken up, is beginning to dilate, and is easily dilatable and soft—a condition which has aptly been described as "ripe." If the cervix is long and closed and the patient's condition is deteriorating rapidly in spite of treatment, then caesarean section under local analgesia should be the method of delivery.

Eclampsia is treated by morphine sulphate ½ gr. (32 mg.) and sodium phenobarbitone or "nembutal" intramuscularly. Apart from loosening the clothes the patient is not undressed or examined in any way until she is heavily under the influence of sedatives. Glucose, 20 per cent. solution, is used in all cases. Magnesium sulphate, 50 per cent. solution, for intramuscular injection, is kept in reserve for the cases which do not respond: these are exceedingly rare. When there has been no fit for twenty-four hours the patient is examined vaginally, and if the cervix is "ripe" the membranes are ruptured. So far caesarean section has not had to be performed for eclampsia.

Infection—Of the sulphonamides, sulphadiazine is the drug most often used. Penicillin is reserved for cases that do not respond or for cases that are severe at the onset. As a prophylactic against infection penicillin is given to all cases of manual removal of the placental, failed forceps, and internal version, and to those in which the membranes have raptured for more than twenty-four hours or the labour has been unduly prolonged. If caesarean section is to be performed on an infected or potentially infected patient a million units of penicillin are left in the peritoneal cavity and the drug is given systemically for five days after operation. In urinary infections sulphanilamide is used on account of its free solubility.

Disproportion—The bordeline cases are given a trial labour and if this fails lower-segment caesarean section is performed. In all primigravidae in whom the head is not engaged near term antero-posterior, inlet, lateral, and outlet radiographs of the pelvis are taken. Frequent use is made of lateral x-ray films to follow the course of a trial labour, and these have been most helpful.

Cardiac Disease—This is treated in mild cases by frequent periods of rest in hospital during the pregnancy. In the severe cases the patient may spend the greater part of the pregnancy in hospital. Caesarean section under local analgesia is reserved for the severest cases. All patients with valvular disease are given penicillin for a week after delivery in an effort to prevent infection, which even in a mild form so often leads to a marked breakdown in the cardiac reserve.

Sedatives and Anaesthetics—Pethidine in doses of 100 mg. intramuscularly is the routine sedative used. It is often combined with hyoscine hydrobromide 1/150 gr. (0·43 mg.). Since the introduction of pethidine it is rare to have to use morphine. A "heavy" spinal analgesic is used to anaesthetize the perineum if forceps are required for a patient with respiratory or cardiac disease. Spinal analgesia is never used for other forceps deliveries or for caesarean section. In a healthy patient these operation are carried out under general anaesthesia. Local analgesia is employed for caesarean section when indicated by the general condition of the patient.

The Puerperium—The patients are allowed out of bed on the seventh day and normal cases are discharged on the tenth day. Active movement and breathing exercises are encouraged from the very beginning. Each ward is visited daily by a physiotherapist, who conducts the exercises. During a period of eight years, with 12,830 deliveries, there have been only two deaths from pulmonary embolism.

Management of Eclampsia

Brown (*Kansas M.J.*, **49**:405, 1948) is of the opinion that eclampsia is the final clinical manifestation of a toxemic pregnancy. Its appearance suggests inattention on the part of the patient or her physician to obvious "storm warnings." Deaths from eclampsia seldom occur in patients receiving good prenatal care. The relagation of prenatal checkups to a nurse must be condemned. The regular recording of weight and blood pressure measurements and the critical interpretation of changes in these values are essential to the early detection of toxemia and the prevention of eclampsia. Any patient who gains more than 1 pound (453·6 Gm.) a week or 5 pounds (2,268 Gm.) a month, or whose diastolic blood pressure increases by more than 20 mm. of mercury, should be viewed with suspicion. The use of diets high in protein and low in salt largely eliminates the development of toxemia and eclampsia. Once eclampsia has supervened, individualization is essential. Deep sedation is necessary to control convulsions. Morphine, tribromoethanol and paraldehyde are suitable, the latter two avoiding an antidiuretic effect. Both extremes of dehydration and drowning are to be avoided. Fluid balance should be maintained by the infusion of 50 to 75 cc. of isotonic dextrose solution per hour. The interval induction of labor by the rupture of membranes will usually permit favourable termination of the pregnancy.

Pregnancy Complicated by Diabetes Mellitus

Barns and Morgans (*Brit. M.J.*, **1**:51, 1949) give in the following lines the summary of their observations:

A series of 58 diabetic pregnancies in 45 patients is reviewed.

In the majority of patients the carbohydrate tolerance was found to diminish as pregnancy advanced. In some, however, it increased prior to delivery, and it is possible that oestrogens given therapeutically may have been a factor in this improvement.

The tendency of the pregnant diabetic to develop hydramnios is confirmed.

It was found that hypoglycaemic symptoms and coma tend to occur in early pregnancy, and ketosis and diabetic coma in the latter part of pregnancy.

There is a greater tendency for the diabetic to develop late pregnancy toxaemia than the non-diabetic, and the relative incidence varies with the standard of severity of toxaemia taken for comparison.

The maternal prognosis is good, and pregnancy does not make the diabetes worse provided that it is well treated.

The late foetal mortality was 55 per cent in a first series of 43 pregnancies. In a second series of 15 pregnancies in which oestrogens were given there were only three deaths. The cause of the foetal mortality is discussed, and it is suggested that the factor affecting the viability of the foetus probably arises in the maternal anterior pituitary lobe. The incidence of abortion does not appear to differ from that for non-diabetic pregnancies, and suggests, first, that diabetes mellitus is not a cause of abortion, and, secondly, that the factor which reduces foetal viability exerts its strongest influence towards the end of pregnancy.

Congenital deformities, gigantism, and hypoglycaemia of the newborn are briefly discussed, and it is suggested that the tendency to gigantism is due to an excess of the growth hormone from the maternal pituitary gland.

Effect of Estrogen on Lactation

Gershenfeld and Perlmutter (*J. Clin. Endoerinol*, **8**:875, 1948) report 501 women who were delivered at the Newark Beth Israel Hospital and who did not nurse. In 238 of these women lactation was suppressed by administering 1·5 mg. of ethinyl estradiol daily in three equally divided amounts; this regimen was started on the day following delivery and was continued for the duration of the hospital stay, which varied from six to nine days. One hundred and twenty-eight non-nursing mothers formed a control series. In them the subsequent pain and engorgement of the mammary glands were treated by the administration of 200 mg. of camphor monobromate capsules four times daily, limitation of fluids, saline purgation and tight breast binding. During the hospital stay of the puerperal women pain and engorgement in the breast were most effectively relieved in those who received ethinyl estradiol, whereas the camphor regimen with other supportive therapy was highly ineffectual during the same period. There was no increase in the amount of blood in the lochia while under this estrogen medication and the number of instances of recognizable withdrawal bleeding was so small as to be negligible. On release from the hospital the women who were given ethinyl estradiol showed the highest percentage of continued difficulty at home with free leakage of milk, breast engorgement and pain, as compared with that of the group treated with camphor dedication and supportive therapy, and even with that of the group of 101 non-nursing mothers who did not receive any treatment during their hospital stay. Difficulties experienced by the non-nursing mothers after omission of ethinyl estradiol could be reduced to a minimum if this medication were available to them after leaving the hospital. When it was not available, the regimen of camphor with supportive treatment appeared to be more successful in this respect only.

Celiac Diseases

Sheldon (*Brit. M.J.*, **2**:548, 1948) emphasizes that celiac disease should be distinguished from other causes of steatorrhea in childhood, particularly from fibrocystic disease of the pancreas. The age of onset of these two conditions is different; children with celiac disease develop normally for several months up to a year or more after birth, while those with pancreatic fibrosis present symptoms from birth. The meconium may be of such stiff consistency as to give rise to symptoms of intestinal obstruction within a few days of birth, often with fatal results, and the name "meconius ileus" aptly describes this aspect of fibrocystic disease of the pancreas. Another point of contrast lies in the appetite. Children with celiac disease have a notoriously fickle appetite, but infants with pancreatic fibrosis have a good, even voracious appetite. The odor of the stools in pancreatic fibrosis is even more repellent than that of the celiac stool; besides the probable excess of fat and starch in both stools the pancreatic stool contains unabsorbed and decomposed dietary protein. Trypsin, lipase and amylase are produced in normal amounts by children with celiac diseases, but are either absent or much reduced in children with pancreatic fibrosis. In the early months of life, before celiac disease develops, the infants thrive satisfactorily on a diet of either breast milk or cows' milk. The age of onset of celiac disease usually coincides with the stage when the diet is expanding from milk to mixed feeding. The greatest change at this age is the addition to the diet of starch in rapidly increasing amounts. While children with celiac disease pass an excessive amount of fat in their stools, the view that fat in their diet should be severely reduced is difficult to maintain; indeed, the evidence would suggest that attention ought to be directed primarily towards their difficulty with starches.

Thrombocytopenic Purpura and Metropathia Haemorrhagica

Borges (*Indian, J.M.Sc.*, **3**:11, 1949) reports a case of thrombocytopenic purpura mistaken for metropathia haemorrhagica.

A young female with uterine bleeding that is resistant to all treatment should not be considered as a case of metropathia haemorrhagica until certain blood diseases are excluded.

The pathogenesis of thrombocytopenic purura, and the various measures adopted in its treatment are discussed.

Splenectomy is the only measure that can be relied upon to relieve the patient in most cases.

Tuberculous Meningitis

Rubie and Mohun (*Brit. M.J.*, **1**:338, 1949) give in the following lines the summary of their observations on 67 cases of tuberculous meningitis admitted at a unit at Highgate Hospital established under the auspices of the Medical Research Council.

Diagnosis—The clinical and laboratory findings in 76 admissions are analysed. A diagnosis of tuberculous meningitis was made in 67 cases. The remaining 9 included five examples of a meningeal reaction in tuberculous subjects which may have been cases of serious tuberculous meningitis.

The problems of early diagnosis are discussed in relation to these cases. Mental apathy is an important early diagnostic feature. In 3 cases of tuberculous meningitis the C.S.F. was normal in the earliest stage in spite of clinically suggestive features. Diagnostically important C.S.F. changes are fall in sugar, rise in protein, and pleocytosis.

Prior to and within 48 hours of admission acid-fast bacilli were seen in the C.S.F. in 39 cases (58 per cent). M. tuberculosis was recovered by culture and/or guinea-pig inoculation in 58 cases (87 per cent). Diagnosis by one or botth of these criteria was established in 62 cases (92 per cent.).

A positive history of contact with tuberculosis was obtained in 12 of 21 patients (57 per cent.) under 3 years of age, and in 11 of 46 patients (24 per cent.) over 3 years of age.

The commonest interval between the first appearance of signs or symptoms and the day of diagnosis was 8-15 days.

The Mantoux reaction was positive in 50 of 51 cases.

Abnormalities in the chest radiograph were seen in 50 of 66 cases.

Treatment—Cases were classified on admission as "early", "middle," or "advanced." Of these, 54 are considered, with a minimum observation period of 231 days (8 months). Forty cases received combined intrathecal and intramuscular streptomycin. Of these, 15 (37 per cent.) survive—comprising 8 of 14 early cases (57 per cent.), 6 of 16 middle cases (37 per cent.), and 1 of 10 advanced cases (10 per cent).

Ten cases received intramuscular therapy only (in the early part of our work), and two survived. Four cases received intramuscular therapy followed by combined therapy: one of these survived.

Important factors operating against success are vascular changes in the brain and hydrocephalus. Further work is essential to assess the value of surgical intervention to combat the hydrocephalus.

Strains of M. tuberculosis isolated from 43 patients have not shown resistance to streptomycin.

Eighteen cases (33 per cent.) survive, and of these 16 show full clinical recovery 14 having entirely nomal C.S.F. and 2 showing slight abnormalities. Two survivors have a history of relapse and show definitely abnormalities. Two survivors have a history of C.S.F. The diagnosis has been confirmed bacteriologically in all except one of the survivors.

Apart from streptomycin, the most important aids to successful treatment are the rapidity of diagnosis and the quality of the nursing.

The value of intrathecal sulphetrone in addition to streptomycin is now being investigated.

Central Nervous System Involvement During Mumps

Brown and others (*Am. J. Med. Sc.*, **215**:434-441, 1948) write that the involvement of central nervous system before, during or after an attack of mumps is well known. It may be due to virus of mumps or by activation of a neurotropic virus by the virus of mumps. The clinical signs are headache, nausea, vomiting, mental confusion, etc. To determine the manifest and non-manifest nervous system involvement the authors did regular lumbar punctures in 77 cases of mumps. 33·7 per cent showed pleocytosis in C.S.F. while only 1·17 per cent. showed clinical signs of C.N.S. involvement. Among patients who had epididmyo-orchitis 42 per cent showed pleocytosis. Though most of the cases are benign, authors report one case who had severe C.N.S. involvement and had not completely recovered at the end of two and a half years.

Oral Streptomycin in Infantile Gastro-Enteritis

James and others (*Lancet*, **2**:555, 1948) report on the results of oral administration of streptomycin in thirty cases of infantile gastroenteritis. Except in those infants who were critically ill on admission, a routine treatment was adopted in all cases. This comprised an initial period of starvation for twenty-four hours with only sterile water by mouth; the gradual building-up of milk feeds at the rate of 60 calories per day. No sugar was added to the feeds until the third or fourth day. In those cases in which intravenous fluids were indicated a mixture of one-fifth physiological saline with 5 per cent. glucose, or one-quarter physiological saline with 2·5 per cent. glucose, was used. Streptomycin dissolved in sterile water, was given immediately before each feed; the dosage adopted being 0·5 gm. in the first twenty-four hours, and 0·25 mg. in each subsequent twentty-four hours for six days, *i.e.*, a total dose of 2 gm. in seven days. The streptomycin solution was made up so that the fraction of the daily dose to be given before each feed was contained in 1 c.cm., which was given with a spoon or pipette, or direct from the hub of a syringe. It was found that children so treated tolerated the milk feeds well, so that they could be increased at the rate of 100 calories per day. Three infants, critically ill on admission, were given streptomycin immediately, without previous routine treatment. The response was spectacular, and the children were ready for discharge on the ninth, tenth and twelfth days after admission. Streptomycin by mouth proved effective in eliminating Proteus vulgaris from the stools, and was also effective in those cases of gastro-enteritis in which no pathogenic organisms were found. Its use shortened the course of the illness considerably, the usual time of discharge from hospital being nine to fourteen days. No toxic reactions were noted.

Pediatric Approach to Tonsillectomy

Gloven (*Arch. Dis. Child.*, **23**:1, 1948) considers the incidence of tonsillectomy among children excessive. In the last twenty years more than one and half million tonsillectomies have been done on public elementary school children in England and Wales. More boys are submitted to this operation than girls and the highest incidence is between five and seven years. The indication for tonsillectomy are objective (size and appearance) and the indirect (the prophylactic curative effect). It is difficult for anybody to diagnose an infected tonsil before it is taken out and because of its functions every tonsil is bound to show signs of infection. The size of the tonxil is no criterion. Though repeated attacks of tonsillitis form an indication for the removal, yet there is confusion as to how frequent must be the attacks to condemn them. Tonsils have been removed for frequent colds, but these are now understood to be caused by sinusitis rather than the tonsils. Toncillectomy has no beneficial action on asthma or allergic conditions, neither is the evidence good as regards its value in the prevention of nephritis and acute rheumatism. A decrease in tonsillectomies has not increased the incidence of otitis media and cevical adenitis.